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Amoco Corporation
200 East Randolph Drive
Chicago, Illinois 60601
Environmental Affairs & S

Philip C. Morris
Superfund Coordinator

August 27, 1992

SEND VIA FEDERAL EXPRESS

Mr. Tom Dunkelman (H-7-1)
U. S. Environmental Protection Agency, Region IX
75 Hawthorne Street
San Francisco, California 94105

Dear Mr. Dunkelman:

Del Amo Superfund Site
Los Angeles, California

Pursuant to our August 14, 1992, telephone conversation, the following paragraphs are responsive to USEPA's July 20 Information Request regarding the above subject. The nomenclature used in the responses is consistent with that of the questions contained in Attachment B of the Agency's Information Request.

1. Amoco Chemical Company (ACC) is currently the owner of approximately 2.1 acres of property identified as 1225 West 196th Street, Torrance, California 90502-1199. The property is further described as follows:

> **Parcel 1**: The easterly 258 feet of the westerly 467 feet of the south 3 acres of lot 5 of Tract No. 4671, in the county of Los Angeles, state of California, as per map recorded in book 56 pages 30 and 31 of Maps, in the office of the county recorder of said county.
>
> **Parcel 2**: The northerly 12-1/2 feet of the easterly 258 feet of the westerly 467 feet of lot 6 of the Tract No. 4671, in the county of Los Angeles, state of California, as per map recorded in book 56 pages 30 and 31 of Maps, in the office of the county recorder of said county.

ACC previously owned 1.54 acres purchased in 1974 from CC&F Western Development Co., Inc., c/o Stephens, Jones, La Fever & Smith (MLM), 800 Wilshire Boulevard, Los Angeles, California 90017, and sold in 1979 to Cadillac Fairview/California, Inc. 2200 West Artesia Boulevard, Compton, California 90220. The property is further described as follows:

> Parcel A of Parcel Map L. A. No. 3041, as filed August 22, 1975, as Instrument No. 5046 in Book 61 at Pages 81 and 82 of Parcel Maps, Los Angeles County, California.

2. ACC has conducted several environmental investigations of the property described as Parcels 1 and 2 in the above response. Copies of the investigation reports are enclosed for your reference. A summary of the reports' findings has also been prepared and is enclosed.

3. In 1988, in anticipation of reconstruction activities, a voluntary soil sampling program was conducted. Laboratory analyses indicated the presence of volatile organic compounds (VOC) in the parts per million range in shallow soils at some locations of Parcels 1 and 2. Approximately 200 tons of soils excavated for construction purposes were transferred to the USPCI waste disposal facility at Grassy Mountain, Utah.

4. In the operation of a polystyrene manufacturing facility, minor surface spills or leaks may occasionally occur from various pieces of equipment such as pumps, valves and piping. These types of releases may have occurred during the life of the ACC facility. Additionally, Amoco believes that there may have been releases on adjacent properties by other parties that have contaminated subsurface groundwater. These releases appear to have since migrated under the ACC facility. Data regarding the groundwater contamination is contained in the documents referenced in the response to Question 1.

Should you have any questions or require additional information please contact Ms. Michelle Roddy as follows:

Amoco Corporation
200 East Randolph, Mail Code 4901
Chicago, Illinois 60601

Phone: (312) 856-5994
Fax: (312) 616-0414

Sincerely,

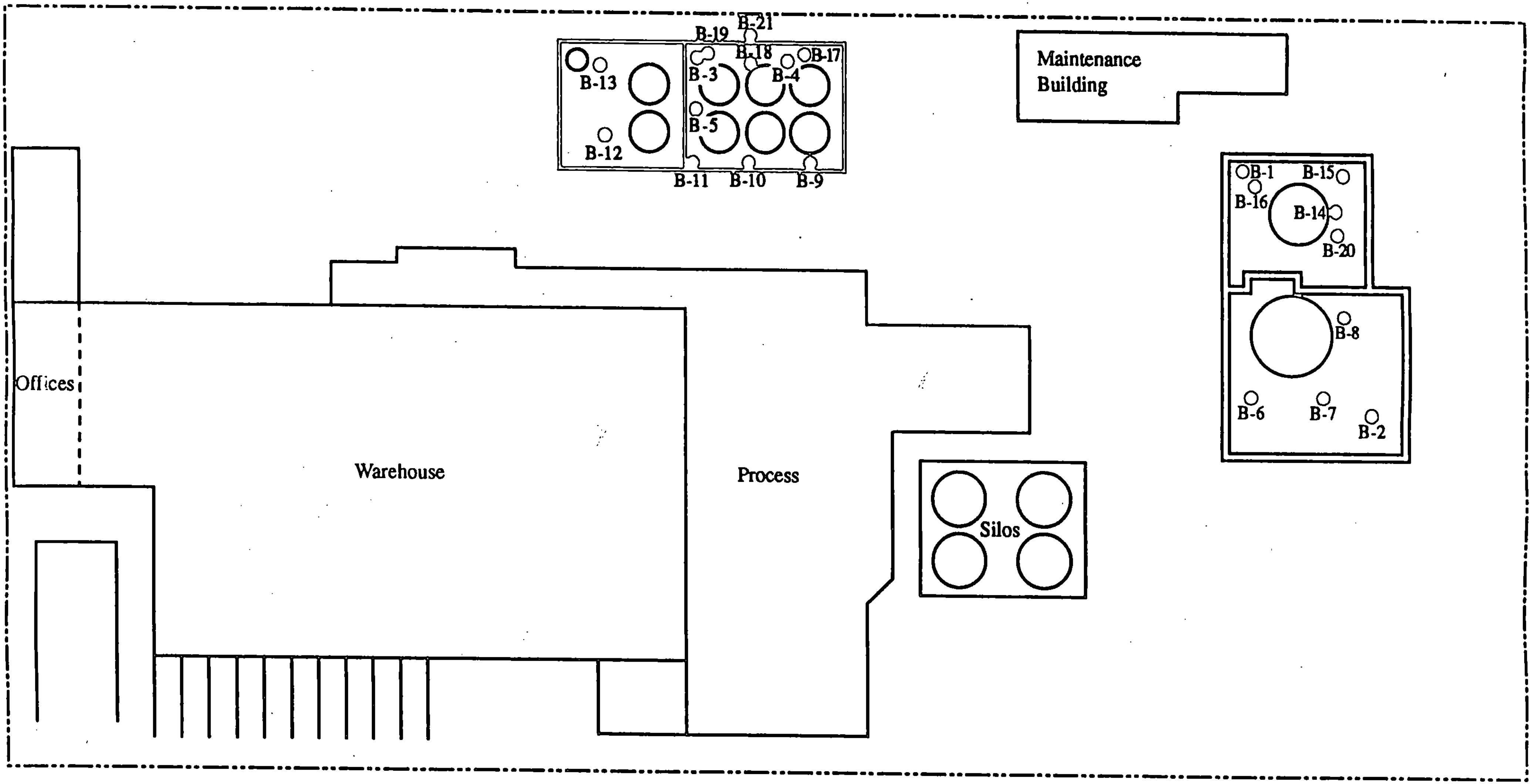
Philip C. Morris

Philip C. Morris
Superfund Coordinator
Amoco Corporation

Enclosures

SUMMARY OF ENVIRONMENTAL INVESTIGATION DATA

Amoco Chemical Company
Polystyrene Manufacturing Facility
Torrance, California



N

0 40 80
Scale in feet

○ B-1 Exploratory Boring
Approximate Location

Soil Sample Approximate Locations

Amoco Chemical Company
Polystyrene Facility
1225 West 196th Street
Torrance, California

AMOCO

May, 1992

Analytical Results for Soil Samples
Amoco Chemical Company
Polystyrene Facility, Torrance, California

Sample Location/Depth (ft)	Styrene	Ethyl-benzene	TCE	PCE	1,1,1-TCA	Benzene	Carbon disulfide	Toluene
B-01/01	<1.0	50	<1.0	4	<1.0	<1.0	<1.0	<1.0
TD - 5 ft	--	--	--	--	--	--	--	--
B-02/01	--	--	--	--	--	--	--	--
TD - 3 ft	--	--	--	--	--	--	--	--
B-03/05	9	47	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
TD - 5 ft	--	--	--	--	--	--	--	--
B-04/02	<2.0	140	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
TD - 5 ft	--	--	--	--	--	--	--	--
B-05/01	100	720	<10	<10	<10	<10	<10	<10
TD - 5 ft	--	--	--	--	--	--	--	--
B-06/05	--	--	--	--	--	--	--	--
/10	<0.1	<0.05	0.1	<0.05	<0.05	<0.05	<0.1	<0.05
/15	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05
/20	--	--	--	--	--	--	--	--
B-07/05	--	--	--	--	--	--	--	--
/10	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05
/15	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05
/20	--	--	--	--	--	--	--	--
B-08/05	--	--	--	--	--	--	--	--
/10	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05
/15	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05
/20	--	--	--	--	--	--	--	--
B-09/05	--	--	--	--	--	--	--	--
/10	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05
/15	--	--	--	--	--	--	--	--
/20	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05
B-10/05	--	--	--	--	--	--	--	--
/10	<1.0	<0.5	44	8	<0.5	<0.5	<1.0	<0.5
/15	--	--	--	--	--	--	--	--
/20	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05

Analytical Results for Soil Samples
Amoco Chemical Company
Polystyrene Facility, Torrance, California

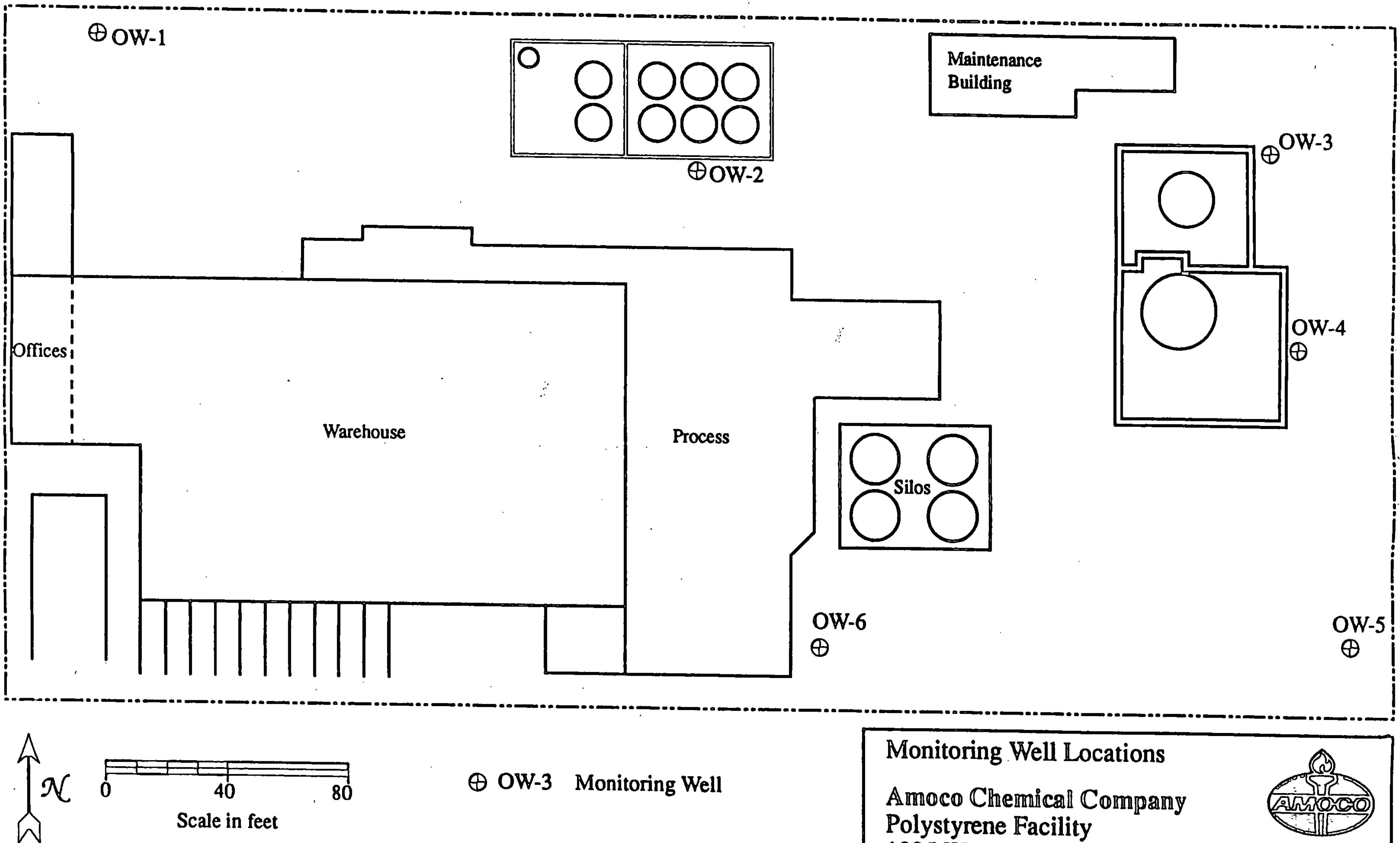
Sample Location/Depth (ft)	Styrene	Ethyl-benzene	TCE	PCE	1,1,1-TCA	Benzene	Carbon disulfide	Toluene
B-11/05	--	--	--	--	--	--	--	--
/10	--	--	--	--	--	--	--	--
/15	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05
/20	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05
B-12/05	--	--	--	--	--	--	--	--
/10	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05
/15	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05
/20	--	--	--	--	--	--	--	--
B-13/05	--	--	--	--	--	--	--	--
/10	--	--	--	--	--	--	--	--
/15	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05
/20	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05
B-14/05	--	--	--	--	--	--	--	--
/10	--	--	--	--	--	--	--	--
/15	1.2	0.7	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05
/20	4.4	0.95	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05
B-15/05	--	--	--	--	--	--	--	--
/10	--	--	--	--	--	--	--	--
/15	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05
/20	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05
B-16/05	--	--	--	--	--	--	--	--
/10	<0.1	<0.05	0.09	0.08	<0.05	<0.05	<0.1	<0.05
/15	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05
/20	--	--	--	--	--	--	--	--
B-17/05	--	--	--	--	--	--	--	--
/10	--	--	--	--	--	--	--	--
/15	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05
/20	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05

Analytical Results for Soil Samples
Amoco Chemical Company
Polystyrene Facility, Torrance, California

Sample Location/Depth (ft)	Styrene	Ethyl-benzene	TCE	PCE	1,1,1-TCA	Benzene	Carbon disulfide	Toluene
B-18/05	--	--	--	--	--	--	--	--
/10	--	--	--	--	--	--	--	--
/15	330	65	46	2.4	<1.0	<1.0	<2.0	1.1
/20	100	20	6.8	1.4	<1.0	<1.0	<2.0	<1.0
B-19/05	--	--	--	--	--	--	--	--
/10	--	--	--	--	--	--	--	--
/15	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05
/20	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05
B-20/20	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1
/25	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1
/30	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1
/35	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1
/40	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1
B-21/20	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1
/25	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1
/30	<0.05	<0.05	0.11	<0.05	<0.05	<0.05	0.14	<0.1
/35	<0.05	<0.05	0.86	<0.05	<0.05	0.05	0.06	<0.1
/40	<0.05	<0.05	0.15	0.2	0.07	<0.05	<0.05	<0.1

TCE = trichloroethene
PCE = tetrachloroethene
TCA = trichloroethane
-- = Sample not analyzed
<0.1 = Not detected at or above concentration indicated

Notes: (1) Laboratory analysis by GC/MS (EPA Method 8240).
Concentrations reported in mg/kg (ppm).
Compounds not reported were not detected in any sample.
(2) Soil borings B-1 thru B-5:
- Soil samples collected at 1 foot intervals.
- Soil immediately above sample interval was screened in field for organic vapors.
- Samples were selected for laboratory analysis based on field screening results.



Monitoring Well Locations

Amoco Chemical Company
Polystyrene Facility
1225 West 196th Street
Torrance, California

AMOCO

May, 1992

Analytical Results for Groundwater Samples
Amoco Chemical Company
Polystyrene Facility, Torrance, California

Well No.	Date	1,1 DCE	1,2 DCE	TCE	PCE	MCl	1,1 DCA
OW-1	2/1/90	<0.080	<0.080	1.0	<0.080	10	<0.080
	2/21/90	<1.5	<1.5	2.2	<1.5	190	<1.5
	12/5/90	<1.0	<1.0	2.0	<1.0	320	<1.0
	6/20/91	<5.0	<5.0	<5.0	<5.0	1,100	<5.0
	1/16/92	0.008	0.060	2.2	0.19	1,000	<0.003
OW-2	2/1/90	<0.004	<0.004	0.500/0.625	0.050/0.068	<0.020	<0.004
	2/21/90	<0.005	0.006	1.1	0.16	<0.025	<0.005
	12/5/90	<0.010	0.056	3.0	0.42	<0.050	<0.010
	6/20/91	<0.020	0.050/<0.020	2.7/2.7	0.41/0.39	<0.10	<0.020
	1/16/92	<0.003	0.030/0.032	2.7/2.7	0.46/0.39	0.93/0.025	<0.003
OW-3	2/1/90	<0.015	0.054	1.7	0.24	<0.075	<0.015
	2/21/90	0.035	0.15	3.8	1.1	<0.10	<0.020
	12/5/90	<0.020	0.073	2.6	0.29	<0.10	<0.020
	6/20/91	<0.020	<0.020	1.9	0.27	<0.10	<0.020
	1/16/92	0.008	0.059	3.2	0.43	0.007	<0.003
OW-4	2/1/90	0.017	0.064	1.4	0.31	<0.050	<0.010
	2/21/90	<0.015	0.087	3.4	0.40	<0.075	<0.015
	12/5/90	0.046/0.064	0.33/0.33	7.2/7.2	1.6/1.6	<0.125	<0.025
	6/20/91	<0.050	0.36	7.8	1.0	<0.250	<0.050
	1/16/92	0.033	0.19	5.5	1.3	0.005	<0.003
OW-5	2/1/90	0.063	0.20	5.8	1.6	<0.20	<0.040
	2/21/90	0.13/0.10	0.38/0.38	15/16	5.9/5.1	<0.40	<0.080
	12/5/90	<0.10	0.67	21	8.1	<0.50	<0.10
	6/20/91	<0.20	0.90	15	6.6	<1.0	<0.20
	1/16/92	0.15	0.56	14	5.0	0.006	0.010
OW-6	2/1/90	0.021	0.021	1.9	0.78	<0.075	<0.015
	2/21/90	0.056	0.059	7.8	3.3	<0.040	<0.04
	12/5/90	<0.10	0.27	27	11	<0.10	<0.10
	6/20/91	<0.20	<0.20	22	10	<1.0	<0.20
	1/16/92	0.13	0.30	21	9.4	<0.005	0.011

- Laboratory reported no volatile organic compounds in samples collected November, 1988
- Concentrations reported in milligrams per liter (ppm)
- Elevated detection limits caused by dilution in laboratory

0.13/0.10 = Original sample results/duplicate sample results
<0.020 = Not detected at or above concentration indicated

DCE = dichloroethene
TCE = trichloroethene
PCE = tetrachloroethene
MCl = methylene chloride
DCA = dichloroethane

Analytical Results for Groundwater Samples
Amoco Chemical Company
Polystyrene Facility, Torrance, California

Well No.	Date	Benzene	Ethyl-benzene	Total Xylenes	Toluene	Chloro-benzene	Chloroform
OW-1	2/1/90	<0.080	<0.080	<0.080	<0.16	<0.080	<0.080
	2/21/90	<1.5	<1.5	<1.5	<3.0	<1.5	<1.5
	12/5/90	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0
	6/20/91	<5.0	<5.0	<5.0	<10	<5.0	<5.0
	1/16/92	0.003	0.005	0.014	0.004	<0.003	0.037
OW-2	2/1/90	<0.004	<0.004	<0.004	<0.008	<0.004	<0.004
	2/21/90	<0.005	<0.005	<0.005	<0.010	<0.005	<0.005
	12/5/90	<0.010	<0.010	<0.010	<0.020	<0.010	0.025
	6/20/91	<0.020	<0.020	<0.020	<0.040	<0.020	<0.020
	1/16/92	<0.003	<0.003	<0.003	<0.003	<0.003	0.011/0.013
OW-3	2/1/90	<0.015	<0.015	<0.015	<0.030	<0.015	<0.015
	2/21/90	<0.020	<0.020	<0.020	<0.040	<0.020	<0.020
	12/5/90	<0.020	<0.020	<0.020	<0.040	<0.020	<0.020
	6/20/91	<0.020	<0.020	<0.020	<0.040	<0.020	<0.020
	1/16/92	<0.003	<0.003	<0.003	<0.003	<0.003	0.008
OW-4	2/1/90	<0.010	<0.010	<0.010	<0.020	<0.010	<0.010
	2/21/90	<0.015	<0.015	<0.015	<0.030	<0.015	<0.015
	12/5/90	<0.025	<0.025	<0.025	<0.050	<0.025	<0.025
	6/20/91	<0.050	<0.050	<0.050	<0.10	<0.050	<0.050
	1/16/92	0.007	<0.003	<0.003	<0.003	<0.003	0.019
OW-5	2/1/90	<0.040	<0.040	<0.040	<0.080	<0.040	<0.040
	2/21/90	<0.080	<0.080	<0.080	<0.16	<0.080	<0.080
	12/5/90	<0.10	<0.10	<0.10	<0.20	<0.10	<0.10
	6/20/91	<0.20	<0.20	<0.20	<0.40	<0.20	<0.20
	1/16/92	0.022	<0.003	<0.003	<0.003	<0.003	0.034
OW-6	2/1/90	<0.015	<0.015	<0.015	<0.030	<0.015	<0.015
	2/21/90	<0.04	<0.04	0.21	<0.080	2.8	<0.04
	12/5/90	<0.10	<0.10	<0.10	<0.20	<0.10	<0.10
	6/20/91	<0.20	<0.20	<0.20	<0.40	<0.20	<0.20
	1/16/92	0.028	<0.003	<0.003	<0.003	<0.003	0.069

- Laboratory reported no volatile organic compounds in samples collected November, 1988
- Concentrations reported in milligrams per liter (ppm)
- Elevated detection limits caused by dilution in laboratory

0.13/0.10 = Original sample results/duplicate sample results
<0.020 = Not detected at or above concentration indicated

DCE = dichloroethene
TCE = trichloroethene
PCE = tetrachloroethene
MCl = methylene chloride
DCA = dichloroethane

1050-000 ~~~~
0639-2336

AMOCO CHEMICAL COMPANY POLYSTYRENE FACILITY TORRANCE, CALIFORNIA

ENSR

ENVIRONMENTAL ASSESSMENT SAMPLING AND ANALYSIS PLAN

ENSR Consulting & Engineering

(Formerly ERT)

June 1989
DOCUMENT NO. 0350-004.2

ENSR

AMOCO CHEMICAL COMPANY POLYSTYRENE FACILITY TORRANCE, CALIFORNIA

ENVIRONMENTAL ASSESSMENT SAMPLING AND ANALYSIS PLAN

ENSR Consulting & Engineering

(Formerly ERT)

June 1989
DOCUMENT NO. 0350-004.2

ENSR

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ENSR

1.0 INTRODUCTION

1.1 BACKGROUND

AMOCO Chemical Company operates a polystyrene manufacturing facility located at 1225 West 196th Street, Torrance, California. The plant location is shown on Figure 1, Site Location Map. Plant operations consist of formulating polystyrene product using styrene as a raw process material. Raw styrene is bulk-stored in two above-ground storage tank areas designated Tank Area 1 and Tank Area 2, as depicted on Figure 2, Site Plan.

Previous environmental studies conducted in 1988 have the revealed the presence of styrene, ethylbenzene, and tetrachloroethene in Tank Area 1 and Tank Area 2. These prior studies consisted of laboratory analysis of shallow soil samples obtained in various areas surrounding the styrene storage tanks. Results of these tests indicate a concentration of styrene up to 9,000 μg/kg in soils at two feet depth in Tank Area 1; and ethylbenzene at 50,000 μg/kg and tetrachloroethene at 4,000 μg/kg in soils at one foot depth in Tank Area 2.

The following inferences are drawn based on the results of the previous environmental testing:

1. The occurrence of soil contamination appears to occur randomly over large portions of Tank Area 1 and Tank Area 2. However, it is currently uncertain whether soil contamination is isolated in small areas or is present continuously over wide areas.

2. The depth of soil contamination is not known because previous testing has been limited to the upper five feet of the soil profile.

3. The presence of styrene, previously detected only in Tank Area 1 soils, and ethylbenzene, detected in Tank Areas 1 and 2, are presumed to have resulted from routine tank filling and maintenance operations. The occurrence of tetrachlorethene in Tank Area 2 soils is more problematic as this material is reported not to have been used or stored in either area.

ENSR

1.2 Purpose and Scope

The purpose of this Plan is to guide field and laboratory activities designed to estimate the horizontal and vertical extent of soil contamination by styrene, ethyl benzene, tetrachloroethene, and related volatile organic compounds. This information will be used to develop detailed potential remedial options such as excavation and disposal of contaminated soils or active soil venting with vapor treatment. The selected remedial options would be coordinated with planned construction activities at Tank Area 1 and Tank Area 2.

The scope of this Plan includes approximately fifteen test borings with soil sampling to anticipated depths of about 20 feet by powered auger equipment. There is also a provision for limited hand auger sampling in areas inaccessible to motorized equipment. Selected samples will be laboratory analyzed by appropriate methods to test for the occurrence of soil contaminants currently known to occur in Tank Areas 1 and 2. An additional element of this Plan is a project-specific Health and Safety Plan designed to minimize the exposure of field personnel to potentially harmful substances and conditions, and detailing emergency response procedures. The Health and Safety Plan is presented in Appendix A.

ENSR

2.0 TECHNICAL APPROACH

2.1 Location of Test Borings

Test borings will be drilled in Tank Area 1 and Tank Area 2. A total of nine borings are planned in Tank Area 1, at the approximate locations shown on Figure 3, Tank Area 1 - Test Boring Locations. Six additional borings are planned for Tank Area 2 as shown on Figure 4, Tank Area 2 - Test Boring Locations. The test boring locations have been selected to maximize the probability of encountering soil contamination and to provide information regarding the lateral and vertical extent of contamination. For example, areas where soil contamination has been detected by prior studies will be tested to determine the depth of contamination, and areas between known areas of contamination will also be tested.

2.2 Drilling Methods

The selected boring locations shown on Figures 3 and 4 will be drilled by powered auger. Additional supplemental soil samples may be collected by hand auger at locations where sampling is indicated by field observations of contamination but which are not accessible by powered auger equipment.

The powered auger equipment consists of a skid-mounted hollow-stem auger specially designed for use in small or restricted spaces inaccessible to standard truck-mounted equipment. Samples are collected by use of standard hammer-driven split-spoon sampler. Any supplemental samples will be collected by hand auger in combination with a hand-operated slide-hammer sampler. The principal limitations of the manual sampling device will be the depth of penetration, which is expected to be about ten feet. If used, this method will enable collection of useful data regarding depth of soil contamination.

2.3 Sample Collection, Logging, and Screening

Soil samples will be collected at ground surface and at 5-foot intervals to the maximum depth of penetration, which is anticipated to be 20 feet in the case of powered equipment and 10 feet with manual equipment.

Soil samples will be collected by the powered auger using an 18-inch,, 2.5-inch diameter, split-spoon drive sampler. Hand auger samples will be collected with a 6-inch long, 2-inch diameter drive sampler fitted with a single 6-inch long brass sample sleeve. All sampling equipment will be thoroughly cleaned and decontaminated before sample collection. Decontamination will consist of a tap water rinse, a thorough scrubbing with tap water and trisodium phosphate detergent, a second tap water rinse, and a final rinse with distilled water.

Lithologic logs of the boreholes will be compiled and recorded from drill cuttings and split-spoon samples by the site geologist. Copies of the logs will be included in the final report for each area. Soils will be described in accordance with the Unified Soil Classification System. Soil moisture, hydrocarbon odors, and other significant characteristics will be noted on the boring logs.

Collected sample materials will be screened in the field as a basis for selection for laboratory analysis. The screening method will consist of ambient temperature headspace analysis of soil materials by use of a portable gas chromatograph calibrated to styrene and ethylbenzene. Those samples exhibiting the highest relative concentration of these vapors in each boring will be laboratory analyzed. Power auger borings will be drilled to depths such that field indications, including vapor concentrations, indicate significant reduction or absence of contamination.

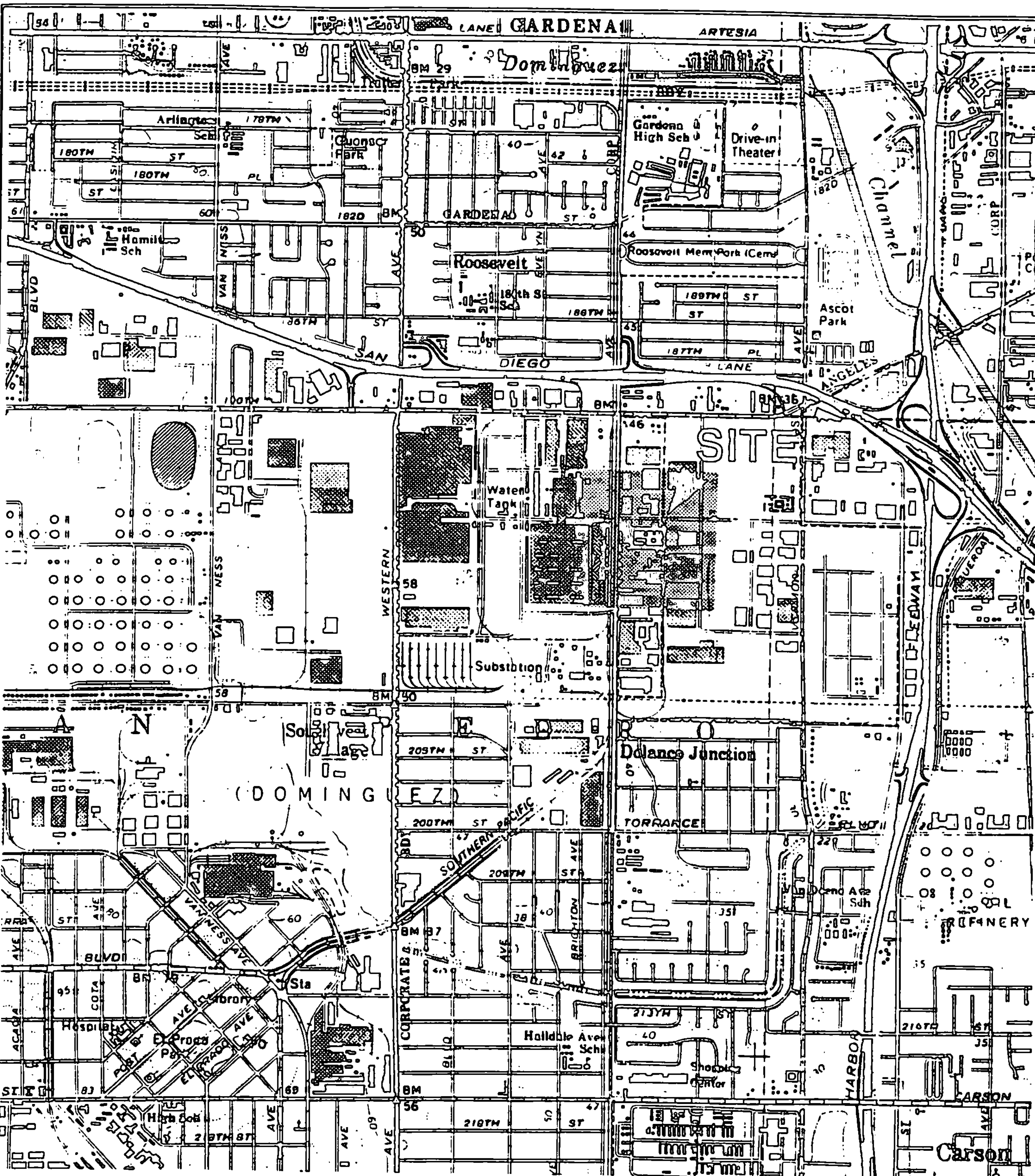
Upon completion of sampling, all borings will be backfilled with cement-bentonite grout to five feet below grade. Drill cuttings will be stored in 55-gallon steel drums. The drums will be labeled with boring number, responsible geologist, and date of boring. Drums will be temporarily stored onsite until laboratory results determine which drum contents will be classified as hazardous for disposal as hazardous materials.

Soil samples will be prepared for shipment to the laboratory as follows. Upon retrieval from the sampler, the sample tube will be covered on both ends with Teflon tape and plastic end caps, secured with plastic tape, and identified with indelible ink. Each sample will be labelled with boring number, sample depth, sample analyses, and data and time collected. Samples will then be placed in a pre-cooled ice chest and transported with documented chain-of-custody forms to a state certified laboratory for chemical analysis.

Soil sampling, field gas chromatography, decontamination, and sample handling procedures will follow the appropriate protocols described in ENSR Standard Operating Procedures attached as Appendices B, C, D, and E.

2.4 Laboratory Analysis

All samples selected for laboratory testing will be analyzed by EPA Method 8240 to determine soil concentrations of the known contaminants styrene, ethylbenzene, and tetrachloroethene, and other related volatile organic compounds.



REFERENCE: USGS 7.5 MINUTE SERIES
TORRANCE QUADRANGLE 1981

N

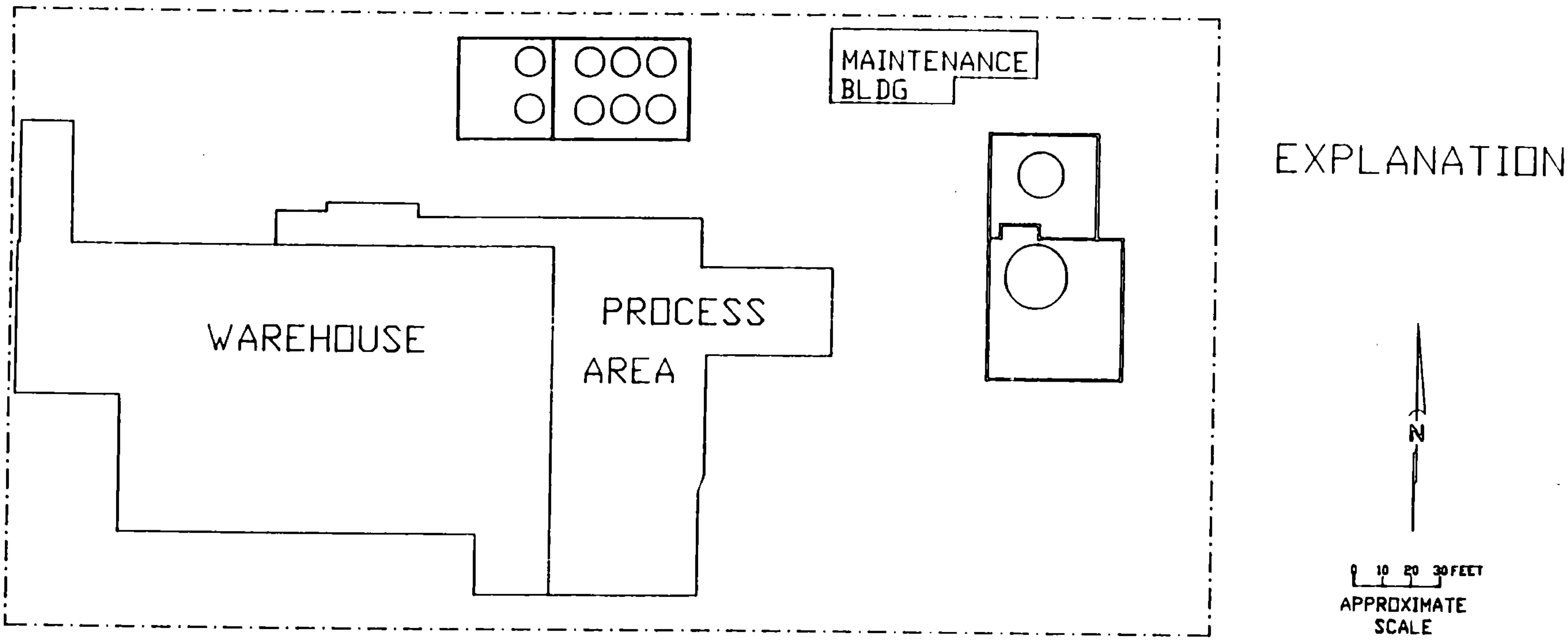
0 ¼ ½ 1 MILE

SCALE

ENSR

SITE LOCATION MAP
AMOCO CHEMICALS CORPORATION
1225 WEST 196th STREET
TORRANCE, CALIFORNIA

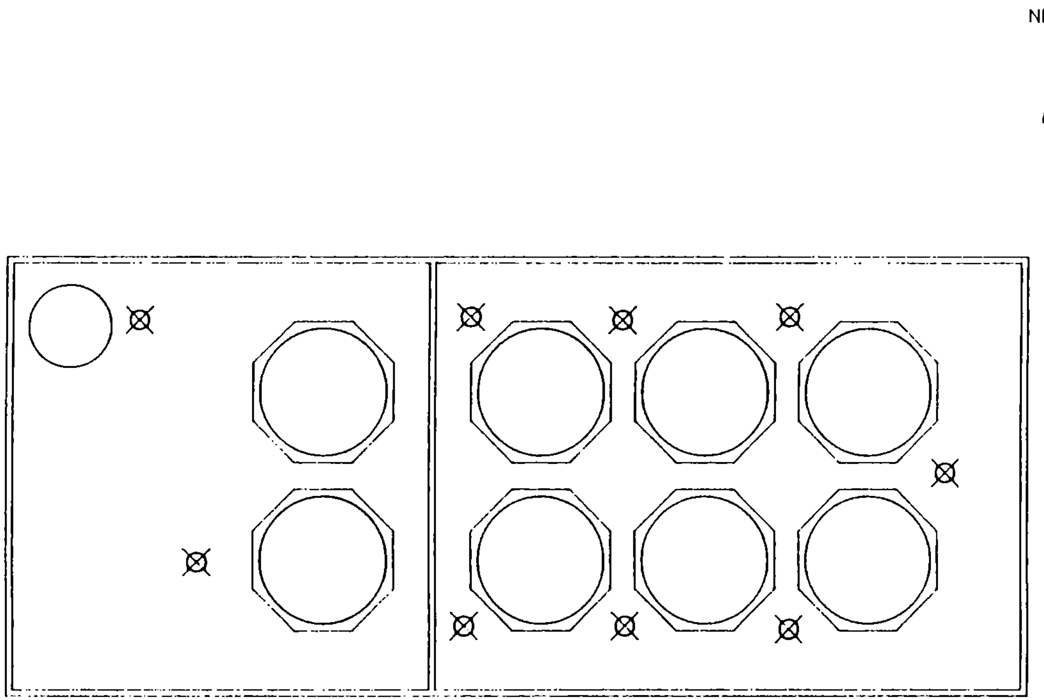
DRAWN BY: BM	DATE: 6/7/89	PROJECT NO.: 0350-004
CHK'D BY:	REVISED:	DWG.NO.: FIGURE 1



ENSR

SITE PLAN
AMOCO CHEMICALS CORPORATION
1225 WEST 196th STREET
TORRANCE, CALIFORNIA

by:C.Koller PROJECT 0350-004 FIGURE 2



EXPLANATION

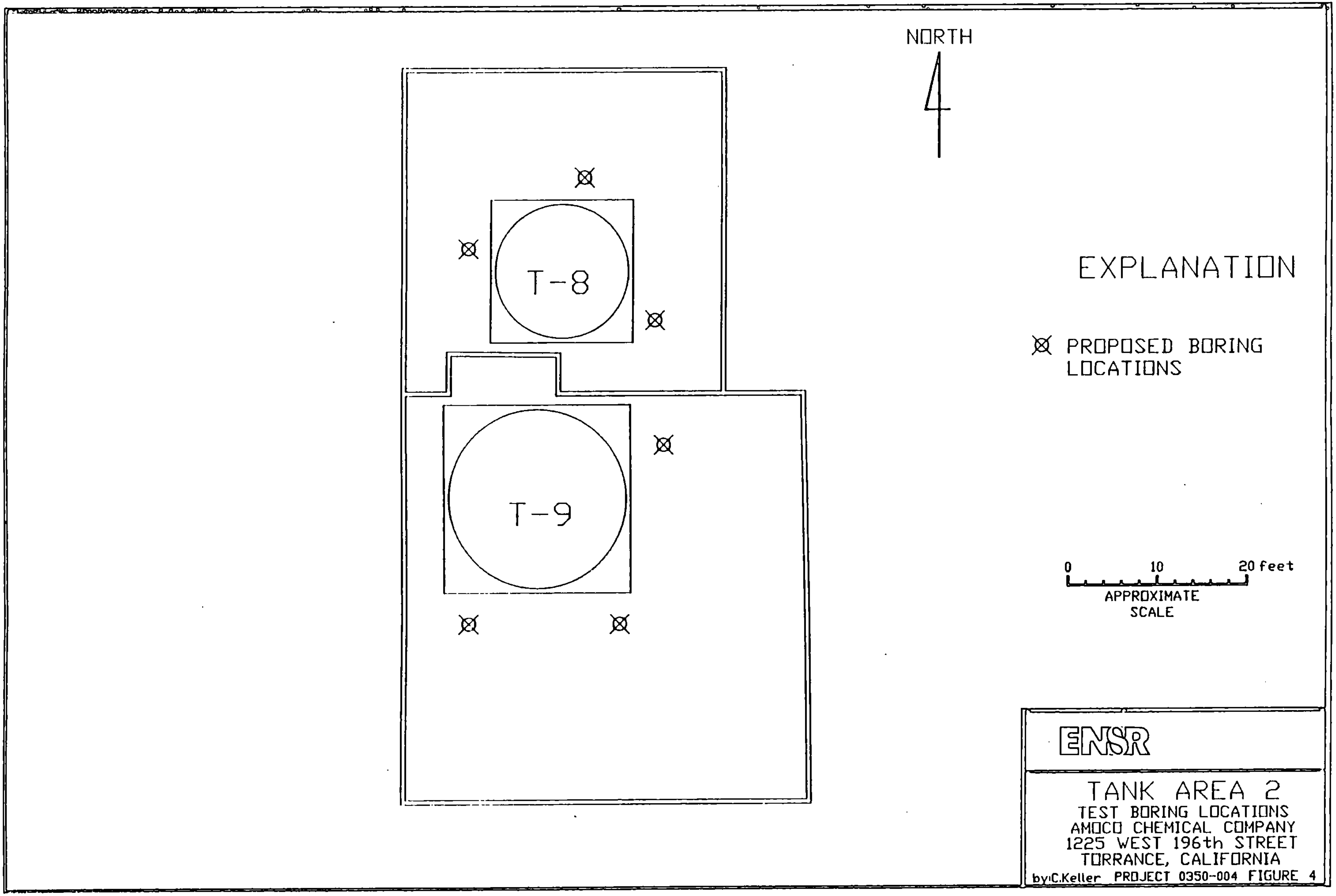
⊗ PROPOSED BORING LOCATION

0 10 feet
APPROXIMATE SCALE

ENSR

TANK AREA 1
TEST BORING LOCATIONS
AMOCO CHEMICAL COMPANY
1225 WEST 196th STREET
TORRANCE, CALIFORNIA

by:C.Keller PROJECT 0350-004 FIGURE 3


NORTH
T-8
T-9
EXPLANATION
PROPOSED BORING LOCATIONS
0 10 20 feet
APPROXIMATE SCALE
ENSR
TANK AREA 2
TEST BORING LOCATIONS
AMOCO CHEMICAL COMPANY
1225 WEST 196th STREET
TORRANCE, CALIFORNIA
by:C.Keller PROJECT 0350-004 FIGURE 4

APPENDIX A

SITE HEALTH AND SAFETY PLAN

HEALTH AND SAFETY PLAN
FOR AMOCO CHEMICAL FACILITY
TORRANCE, CALIFORNIA

ENSR Document No. 0350-004-100
June 1989

Prepared for

AMOCO CHEMICAL COMPANY
Joliet, Illinois

ENSR Consulting and Engineering
19782 MacArthur Boulevard
Irvine, California 92715

ENSR

CONTENTS

ABBREVIATIONS AND ACRONYMS

APR	air-purifying respirator
CPR	cardiopulmonary resuscitation
FP	field personnel
HASP	Health and Safety Plan
HSC	Health and Safety Coordinator
LEL	lower explosive level
OSHA	Occupational Safety and Health Administration
OVA	organic vapor analyzer
PEL	permissible exposure limit
PID	photoionization detector
PM	Project Manager
PPE	personal protective equipment
ppm	parts per million
PVC	polyvinyl chloride
RHSM	Regional Health and Safety Manager

1. INTRODUCTION

This site-specific Health and Safety Plan (HASP) has been developed by ENSR to establish the health and safety procedures required to minimize any potential risk to personnel who will perform activities for the Amoco Chemical Company's polystyrene manufacturing facility in Torrance, California.

The provisions of this plan minimally apply to all ENSR personnel and subcontractors who will potentially be exposed to safety and/or health hazards during the performance of activities associated with this site.

This HASP has been written in compliance with the requirements of the Occupational Safety and Health Administration's (OSHA) Hazardous Waste Operations and Emergency Response Standard (29 CFR 1910.120), the ENSR Consulting and Engineering Health and Safety Policy Manual, and the ENSR Consulting and Engineering Hazardous Waste Site Health and Safety Manual. All activities covered by this HASP must be conducted in complete compliance with this HASP and with all applicable federal, state and local health and safety regulations. <u>Personnel covered by this HASP who cannot or will not comply with these requirements will be excluded from site activities by the ENSR Project Manager</u>.

The procedures in this plan have been developed based upon current knowledge regarding the specific chemical and physical hazards which are known or anticipated for the operations to be conducted at this site.

All personnel covered by this HASP, including subcontractor personnel, must receive a copy of it and return the HASP signoff sheet found on the last page of the plan. This sheet must be returned to the ENSR Project Manager prior to performing any onsite activities.

2. FACILITY BACKGROUND/WORKPLAN

The Amoco Chemical Company currently operates a polystyrene manufacturing facility at 1225 West 196th Street in Torrance, California. Styrene, the raw material used in the manufacturing process, is stored onsite in aboveground storage tanks. These tanks are presently placed on the ground within grouted masonry wall containment structures. Previous site investigations have identified both styrene and ethylbenzene in soils near the storage tanks. Ethylbenzene is a decomposition product of styrene. Tetrachloroethene was also found in at least one sample. Its presence may be due to laboratory cross-contamination.

ENSR's scope of work involves the drilling of approximately 15 soil borings to a maximum anticipated depth of 20 feet within the tank farm. Borings will be drilled using a portable hollow-stem auger; samples will be collected with a split-spoon drive sampler. Samples will be collected at 5-foot intervals.

3. KEY PERSONNEL AND RESPONSIBILITIES

Rich Richter:	Project Manager
Ken Pitchford:	Technical Lead
Mark Wood:	Site Manager and Health and Safety Coordinator
Alice Armstrong:	Regional Health and Safety Manager

The organization and responsibilities for implementing safe onsite activities, and more specifically the requirements contained in this HASP, are described below. The implementation of health and safety at this site will be an integrated effort amongst the ENSR Onsite Manager, the ENSR Regional Health and Safety Manager (RHSM), the appointed onsite Health and Safety Coordinator (HSC), ENSR Field Personnel (FP), and any subcontractor. The specific individuals who will fill these roles on this project are provided on the Emergency References Table at the back of this document.

3.1 ENSR Project Manager

The ENSR Project Manager (PM) is, by designation, the individual who has the primary responsibility for ensuring the overall health and safety of this project. The PM, therefore, has the primary responsibility for ensuring the implementation of the requirements of this HASP. Some of the PM's specific responsibilities include:

- Assuring that all onsite personnel have received a copy of and read this HASP and have completed the HASP signoff sheet.
- Assuring that all personnel have attended a briefing apprising them of the contents of the HASP and site-specific hazards prior to performing work onsite.
- Assuring that sufficient personal protective equipment (PPE), as required by this HASP, is available onsite.
- Assuring that all subcontractor personnel submit the documentation of employee participation in a medical monitoring program and training program.
- Maintaining a high level of health and safety consciousness among employees at the work site.
- Maintaining regular communications with the HSC and, if necessary, the RHSM.

3.2 Regional Health and Safety Manager

The RHSM is the individual responsible for the preparation, interpretation, and modification of this HASP. Modifications to this HASP which may result in less stringent precautions cannot be undertaken by the PM or the onsite HSC without the approval of the RHSM. Specific duties of the RHSM include:

- Advising the PM and HSC on matters relating to health and safety on this site.
- Recommending appropriate PPE and air monitoring instrumentation to protect personnel from site hazards.
- Performing field audits to monitor the effectiveness of this HASP and to assure compliance with it.
- Performing personal exposure monitoring where required and where deemed necessary to determine the adequacy of protective measures and PPE specified by this HASP.
- Maintaining contact with PM to regularly evaluate site conditions and new information which might require modifications to the HASP.
- Working with the PM to ensure that sufficient PPE is available onsite.
- Conducting briefing meetings, when necessary, to apprise personnel of the contents of the HASP and the site hazards.

3.3 Onsite Health and Safety Coordinator

The appointed HSC will be a member of the ENSR project field team. The HSC is responsible for enforcing the requirements of this HASP once onsite work begins. By design, the HSC has the authority to immediately correct all situations where noncompliance with this HASP is noted and to immediately stop work in cases where an immediate danger is perceived. Some of the HSC's specific responsibilities include:

- Procuring and distributing the PPE needed for this project.
- Procuring the air monitoring instrumentation required and performing air monitoring.

- Verifying that all PPE and health and safety equipment is in good working order.

- Setting up and maintaining the personnel decontamination facility.

- Notifying the PM and the RHSM of all noncompliance situations and immediate danger situations.

- Supervising and monitoring the safety performance of all personnel to ensure that required safety and health procedures are followed, and correcting any deficiencies.

- Conducting accident/incident investigations and preparing accident/incident investigation reports.

- Initiating emergency response procedures.

3.4 Field Personnel

All ENSR and subcontractor FP are responsible for following the health and safety procedures specified in this HASP and for performing their work in a safe and responsible manner. Some of the specific responsibilities of the FP are as follows:

- Obtaining a copy of the HASP and reading it in its entirety prior to the start of onsite work.

- Bringing forth any questions or concerns regarding the content of the HASP to the PM or the RHSM prior to the start of work.

- Reporting all accidents and incidents to the PM.

- Complying with the requests of the appointed HSC.

4. JOB HAZARD ANALYSIS

4.1 Chemical Hazards

Styrene and ethylbenzene are aromatic hydrocarbons which have sweet odors at low concentrations. As with many solvent-like hydrocarbons, the primary route of exposure is through the inhalation of vapors. Acute exposure to high concentrations of these hydrocarbons may produce irritation of the mucous membranes of the upper respiratory tract, nose, and mouth, followed by symptoms of narcosis, cramps, and death due to respiratory center paralysis. Effects of short-term exposure under laboratory conditions included prolonged reaction time and decreased manual dexterity. Liquid styrene is a low-grade cutaneous irritant, and repeated contact may produce a dry, scaly, and fissured dermatitis.

OSHA has established a permissible exposure limit (PEL) for styrene of 50 ppm. Styrene sickness - consisting of drowsiness, nausea, headache, fatigue, and dizziness - has been documented in workers exposed at 200 to 700 parts per million (ppm) concentrations. The liquid is flammable (flash point 90°F) with a lower explosive level (LEL) concentration of 11,000 ppm. A PEL of 100 ppm has been established for ethylbenzene. This compound is also flammable (flash point 59°F) and its LEL concentration is 10,000 ppm.

4.2 Physical Hazards

The use of a drilling rig for soil borings can present operational hazards specifically related to drilling rig use. ENSR personnel are to remain clear of the mechanical portions of the rig while it is in operation. If utility lines or cables transect the site, the local utility companies must be alerted to establish drill locations.

5. JOB HAZARD SUMMARY

A significant chemical hazard could be present on this site, both as a result of vapors released during drilling activities as well as the close proximity of tanks and lines to some of the drilling locations. Previous site studies reported field vapor readings as high as 620 ppm at a depth of 1 to 2 feet.

6. AIR MONITORING

6.1 Instruments

An HNu photoionization detector (PID) equipped with a 10.2-eV lamp or a Foxboro organic vapor analyzer (OVA) will be used to monitor the breathing zone of personnel. An action limit of 25 units above background has been established. When the HNu or OVA indicate sustained breathing zone concentrations in excess of 25 units or more, ENSR personnel will use a detector tube for styrene to quantify concentration levels. Respiratory protection, as described in Section 7 of this plan, will be donned should concentrations exceed 25 ppm.

An explosimeter will be used to measure explosive levels of styrene/ethylbenzene released during drilling activities. The instrument should have both an audio and visual alarm. The alarm should be set to sound at 10 percent of the LEL. Should the alarm sound, personnel in the work area will leave and contact the ENSR PM and the RHSM.

6.2 Equipment Use

The use of the OVA and HNu will be in accordance with the guidelines established in ENSR's Standard Operating Procedures (SOP), entitled "Operation/Calibration of OVA-128 Portable Organic Vapor Analyzer No. 7310," and "Operation/Calibration of the HNu Photoionization Analyzer No. 7315," respectively. The SOPs are included as Attachment A. All other equipment will be used per the manufacturer's operating specifications and guidelines. Where applicable, equipment shall be calibrated at the start and end of each day and recorded in the field logbook.

7. PERSONAL PROTECTIVE EQUIPMENT

7.1 Respiratory Protection

If OVA or PID breathing zone readings are sustained above 25 units above background and detector tube results indicate such concentrations, MSA Comfo II half-mask air-purifying respirators (APR) with GMC-H cartridges will be donned. Respiratory protection should also be donned if odors become objectionable at any time. If used, respirator cartridges are to be changed after every 8 hours of use or when breakthrough occurs, whichever is first. If sustained concentrations above 100 ppm are encountered, ENSR should cease operations and confer with both Amoco personnel and the RHSM before proceeding.

7.2 Protective Clothing and Equipment

The following PPE must be worn when performing field activities:

- regular Tyvek coveralls
- inner polyvinyl chloride (PVC) gloves
- outer nitrile gloves
- chemically-resistant steel-toed boots
- hardhat

8. SITE CONTROL

Only authorized personnel will be allowed to enter the work area. The number of personnel should be kept to a minimum in the drilling area. An emergency trained member of Amoco will be present during all drilling activities conducted within the walled enclosure. This individual will be ready to respond immediately should a line be punctured or tank disturbed by ENSR personnel.

9. DECONTAMINATION

Proper decontamination will be required of all personnel and equipment which come into contact with contaminated materials per ENSR's SOP entitled "Decontamination of Equipment No. 7600" (Attachment B). Personnel decontamination will be accomplished by following a systematic procedure of cleaning and removing PPE. Contaminated PPE, such as boots, will be rinsed free of gross contamination, scrubbed clean in a detergent solution, and then rinsed clean. To facilitate this, a three-basin wash system will be set up onsite. Alternative decontamination procedures, such as steam cleaning or pressure washing of field boots, may be used if available. Disposable PPE, such as Tyvek coveralls, gloves, etc., will be disposed of as general refuse. Respirators, if used, will be cleaned after each use with respirator wipe pads and will be stored in plastic bags after cleaning.

10. GENERAL SAFE WORK PRACTICES

The following measures are designed to augment the specific health and safety guidelines provided in this plan.

- The "buddy system" will be used at all times by all field personnel. No one is to perform onsite activities alone.
- Avoidance of contamination is of the utmost importance. Whenever possible, avoid contact with contaminated (or potentially contaminated) surfaces or materials. Walk around (not through) puddles and discolored surfaces. Avoid sitting, kneeling, or resting equipment on contaminated surfaces.
- Protect air monitoring equipment from water and contamination by bagging.
- Eating, drinking, chewing gum or tobacco, smoking, or any practice that increases the probability of hand-to-mouth transfer of materials is prohibited in the work area.
- Hands and face must be thoroughly washed upon leaving the work area before eating, drinking, or any other activities.
- Beards or other facial hair that interfere with respirator fit are prohibited for those individuals who may be required to use respiratory protection.
- The use of alcohol or drugs is prohibited during the conduct of field operations.
- Safety equipment described in Section 6 will be required for all field personnel unless otherwise approved by the ENSR RHSM.
- If any electric-powered equipment is used onsite, it should be explosion-proof, and should be fed electrically through a ground-fault interrupter approved for outdoor use.

11. EMERGENCY RESPONSE PROCEDURES

11.1 Planning

Prior to work site entrance, the HSC shall plan emergency actions and discuss them with personnel conducting project work. Initial planning includes establishing the best means for evacuation from the site in case of a catastrophe (e.g., explosion, fire, etc.)

11.2 Emergency Services

A tested system must exist for rapid and clear distress communications, preferably voice, from all personnel to the HSC. The HSC shall ensure that all personnel working at the site know how to communicate with the appropriate local emergency response units, and provide adequate and clear directions between ENSR work sites and the location of those units, prior to commencing any onsite investigation or operations. Emergency response contacts and telephone numbers are included as Attachment C. A copy of this information must be posted in a visible location onsite before operations commence.

11.3 First Aid

Qualified personnel shall give first aid and stabilize any employee needing assistance. Life support techniques such as cardiopulmonary resuscitation (CPR) and treatment of life-threatening problems such as bleeding, airway maintenance, and shock shall be given top priority. Professional medical assistance shall be obtained at the earliest possible opportunity. If assistance beyond first aid is required, phone 911 and request emergency medical assistance.

A first-aid kit and portable eyewash shall be maintained at each drilling location. When drilling, these items should be kept in a clean location near or on the drill rig.

Emergency first-aid procedures for organic compounds include:

Exposure	Procedure
Eyes	Flush eyes immediately with fresh water for at least 15 minutes while holding the eyelids open. If injury occurs or irritation persists, transport person to emergency room for medical attention as soon as possible.
Skin	Wash skin thoroughly with soap and water. See a doctor if any unusual signs or symptoms or if any skin irritation occurs. Launder contaminated clothing.
Inhalation	Move exposed person to fresh air. If breathing has stopped, apply artificial respiration. Call 911 immediately.
Ingestion	If swallowed, **DO NOT** make person vomit. Call Poison Control Center immediately.

11.4 Fire Protection and Response

To ensure that fire and explosion hazards are minimized, plans and procedures must be coordinated with the local Fire Department. If suitable water supplies are unavailable or where water use may be inappropriate, 20- or 30-pound Class ABC fire extinguishers may be necessary for each drill rig or field crew.

Call 911 in the event of any fire at a work site.

11.5 Guidelines for Response

If any emergency involving actual or suspected personal injury occurs, the HSC, work supervisor, or surviving person shall follow these steps:

- Remove the exposed or injured person(s) from immediate danger.
- Render first aid if necessary. Decontaminate affected personnel.

- Obtain paramedic service or ambulance transport to local hospital by calling 911. An ENSR site member will accompany any person to the medical facility and will remain with the person until release or admittance is determined.

- Other personnel onsite shall be evacuated to a safe distance until the Fire Department determines that it is safe for work to resume.

- At the earliest time practicable, the HSC shall contact the Project Manager, or his designee, and the RHSM, and give details of the incident.

- Any accident/incident resulting in an OSHA recordable injury or illness, treatment at a hospital or physician's office, property damage, or a near-hit accident, requires that an accident/incident report be completed and submitted to the RHSM. A copy of the ENSR Supervisor's Accident/Incident Investigation Report form is found as Attachment D.

12. MEDICAL SURVEILLANCE/TRAINING REQUIREMENTS

All personnel who will be perform or be exposed to activities associated with Task 2 must have completed the training and medical surveillance requirements specified in the OSHA Hazardous Waste Operations and Emergency Response Standard [29 CFR 1910.120(e) and (f)].

Therefore, such personnel must have completed the specified 8 hours of refresher training and/or the 40 hours of initial training within the last year. Managers or supervisors of personnel performing such activities must have completed the specified 8 hours of management training. In addition, such personnel must have completed and passed, without restrictions, an annual and/or baseline occupational medical surveillance examination within the last year.

Documentation of the above, in the form of a copy of each employee's training certificate(s) and summary letter from the occupational medical surveillance examination, must be provided to the ENSR onsite manager, prior to performing activities at the site.

ATTACHMENT A

Title: Operation/Calibration of OVA-128 Portable Organic Vapor Analyzer in the Survey Mode

1.0 Introduction

The organic vapor analyzer (OVA) is used by ERT personnel in the field for safety and survey monitoring of ambient air, determining the presence of volatile organic compounds in soil and water, and detecting leakage of organic volatiles.

Personnel responsible for using the OVA should first read the factor operator instruction manual and be thoroughly trained in the operation, calibration, and maintenance of the instrument.

In the survey mode the OVA provides a continuous, direct readout of the total concentration of organic vapor/gas compounds, expressed as methane equivalent or the equivalent concentration or any organic gas used to calibrate the instrument. It has a chemically resistant sampling system, and can be calibrated to almost any organic compound which is a gas at ambient conditions. The instrument is portable and lightweight (12 pounds), and can be carried about while monitoring. It can also be used as a fixed, remote monitoring device.

2.0 Principal of Operation

During operation, ambient air is continuously drawn into the instrument through the probe/readout assembly and sample channel by an internal pumping system. The sample flow is metered at a constant rate and passed through porous metal particle filters before reaching the detector chamber, a flame ionization detector (FID). The sample is introduced to a hydrogen flame and combusted. Any carbon compounds present are ionized to form positively charged fragments which are collected by a negative electrode, producing a potentiometric change. This electrical signal, proportional to the concentration of organic compounds present, is amplified, transmitted to the probe/readout assembly, and seen as a needle deflection on the meter.

3.0 Specifications

Detection range:	0.01 to 1000 ppm.
Response time:	less than 2 seconds.
Readout:	0-10 ppm, 0-100 ppm, 0-1000 ppm, 250° linear scaled meter; external monitor connector.
Sample flow rate:	nominally 2 liters per minute (not variable).

Fuel supply:	75 cubic centimeter tank of pure hydrogen at maximum pressure of 2300 psig, refillable while in case.
Primary electrical power:	rechargeable and replaceable 12 VDC battery pack.
Service life:	minimum of 8 hours continuous operating time with hydrogen supply and battery power.

4.0 Required Materials

- Calibration Gas: Compressed gas cylinder of methane in air or similar stable gas mixture of known concentration. The selected gas should have an ionization potential similar to that of the vapors to be monitored, if known. The concentration should be at 50-75% of the range in which the instrument is to be calibrated.
- Regulator for calibration gas cylinder.
- Approximately 3-4 feet of teflon tubing
- Fluoroware vent-union tec
- "Magic Marker".
- Hydrogen recharge supply (reagent-grade Hydrogen)

5.0 Start Up

Connect the umbilical cord of the probe/readout assembly to the side pack. Select the desired pickup fixture and ensure that the particle filter is in place. Attach the pickup to the probe/readout assembly.

Move the INSTR switch to the BATT position and check the condition of the battery, indicated by the readout meter. Move the INSTR switch to the ON position and allow five minutes for warm-up.

Move the PUMP switch to the ON position, orient the instrument vertically and check the SAMPLE FLOW RATE indicator. The flow meter should read 2 LPM. Check for air leaks by placing a finger over the probe inlet. The flow rate should immediately drop to 0 and remain there until the inlet is reopened.

Set the CALIBRATE switch to the X10 position. Adjust the meter to read 0 by turning the CALIBRATE knob.

Open the H_2 TANK VALVE and the H_2 SUPPLY VALVE. Never leave the H_2 SUPPLY VALVE open when the pump is not running. Depress the igniter button until the burner lights. A faint "pop" sound can be heard when the flame ignites. Do not depress the igniter button for more than 6 seconds, or damage may occur. If the flame does not ignite, allow the instrument to run for several minutes and again attempt ignition. Ensure that the exhaust port, at the base of the side pack, is not obstructed.

Performing an instrument response verification is a quick and simple method of determining whether the flame is lit. With the CALIBRATE switch set to X1, hold the probe inlet next to the tip of a magic marker. The readout needle should deflect full scale within 2 seconds.

Zero out the background with the instrument located in the cleanest area, representative of the lowest ambient background concentration to be surveyed. Set the CALIBRATE switch to X1 and adjust the meter to read 1 ppm by turning the CALIBRATE ADJUST knob. Remember to subtract 1 ppm from subsequent readings.

6.0 Calibration

The OVA should be calibrated at the beginning of each daily use. Set the CALIBRATE range selection switch to the appropriate setting based on the calibration gas being used. With the instrument in operation and ambient background zeroed out, draw a sample of the calibration gas into the probe. Connect the pickup fixture to the gas cylinder regulator in order that the gas is delivered to the instrument at atmospheric pressure (Figure 6-1).

The calibration gas bottle regulator should be adjusted to deliver at a rate of approximately 2.5-3 liters per minute. During calibration there should be a slight positive pressure from the vent line of one leg of the t-fitting. Turn the GAS SELECT knob so that the meter reads the concentration of the calibration gas, gas mixture, or the equivalent concentration of methane (if the OVA is being calibrated to methane, as is usually the case).

Record the GAS SELECT knob setting in the field log. Also, record the calibration gas used, the compound to which the OVA is calibrated, the OVA readings and whether adjustment is necessary.

7.0 Operation

The side pack assembly is equipped with a handle and a shoulder strap for carrying. The probe/readout assembly is hand held, positioning the pickup fixture at the points of interest.

Readings should be taken with the CALIBRATE switch set to the lowest possible range, switching to higher ranges as greater concentrations of vapor emissions are encountered.

When organic vapors are detected, the meter pointer will move upscale, indicating the equivalent concentration of the compound which the instrument is calibrated to.

Record the meter readings and sample locations in the field log. Instrument response verifications (magic marker test) should be performed occasionally and recorded.

8.0 Shut Down Mode

The following procedure should be used to put the instrument in the shut down mode:

- Close the H_2 SUPPLY VALVE
- Close the H_2 TANK VALVE
- Move the INSTR switch to OFF.
- Wait 5 seconds and move the PUMP switch to OFF.

9.0 Fuel Refilling

The instrument must be in the shut down mode before refilling the fuel tank. Refilling should be done in an area that is well ventilated and free of potential ignition sources.

WARNING: The contents of the hydrogen supply bottle are highly pressurized and extremely flammable. Be cautious.

Connect the filling hose to the hydrogen recharge tank. Turn the FILL/BLEED valve on the hose to the OFF position. Attach the other end of the hose to the refill fitting on the side pack assembly.

Open the supply bottle valve slightly, turn the FILL/BLEED valve to BLEED just momentarily, then turn the FILL/BLEED valve back to OFF. A hissing sound should be heard as the air inside the hose is forced out and replaced with hydrogen.

With the recharge bottle valve opened, open the REFILL VALVE and the H_2 TANK VALVE on the instrument panel. Turn the FILL/BLEED valve to FILL. The pressure in the instrument fuel tank is now indicated on the H_2 TANK PRESSURE gauge. Approximately 150 psi is required for each hour of operation. After the instrument fuel tank is filled, close the REFILL VALVE, the H_2 TANK VALVE, the recharge bottle valve, and turn the FILL/BLEED valve to OFF.

Depressurize the filling hose by turning the FILL/BLEED valve to BLEED then back to OFF. Disconnect the filling hose from the instrument.

With the instrument in the shut down mode, observe the H_2 TANK PRESSURE gauge to see if the pressure decreases rapidly. If the pressure drops more than 350 psi/hr, there is a significant leak in the H_2 supply system.

10.0 Battery Recharging

Battery charging should be done in a non-hazardous area. Plug the charger BNC connector into the mating connector on the battery cover. Insert the AC plug into a 60Hz 115 VAC electrical outlet. Move the battery charger switch to ON. The light above the switch should illuminate.

Battery charge condition is indicated by the meter on the front panel of the charger. The pointer will deflect to the right when charging, and will be in line with the CHARGED marker above the scale when fully charged.

Approximately one hour of charging time is required for each hour of operation. Overnight charging is recommended. The charger can be left on indefinitely without damage.

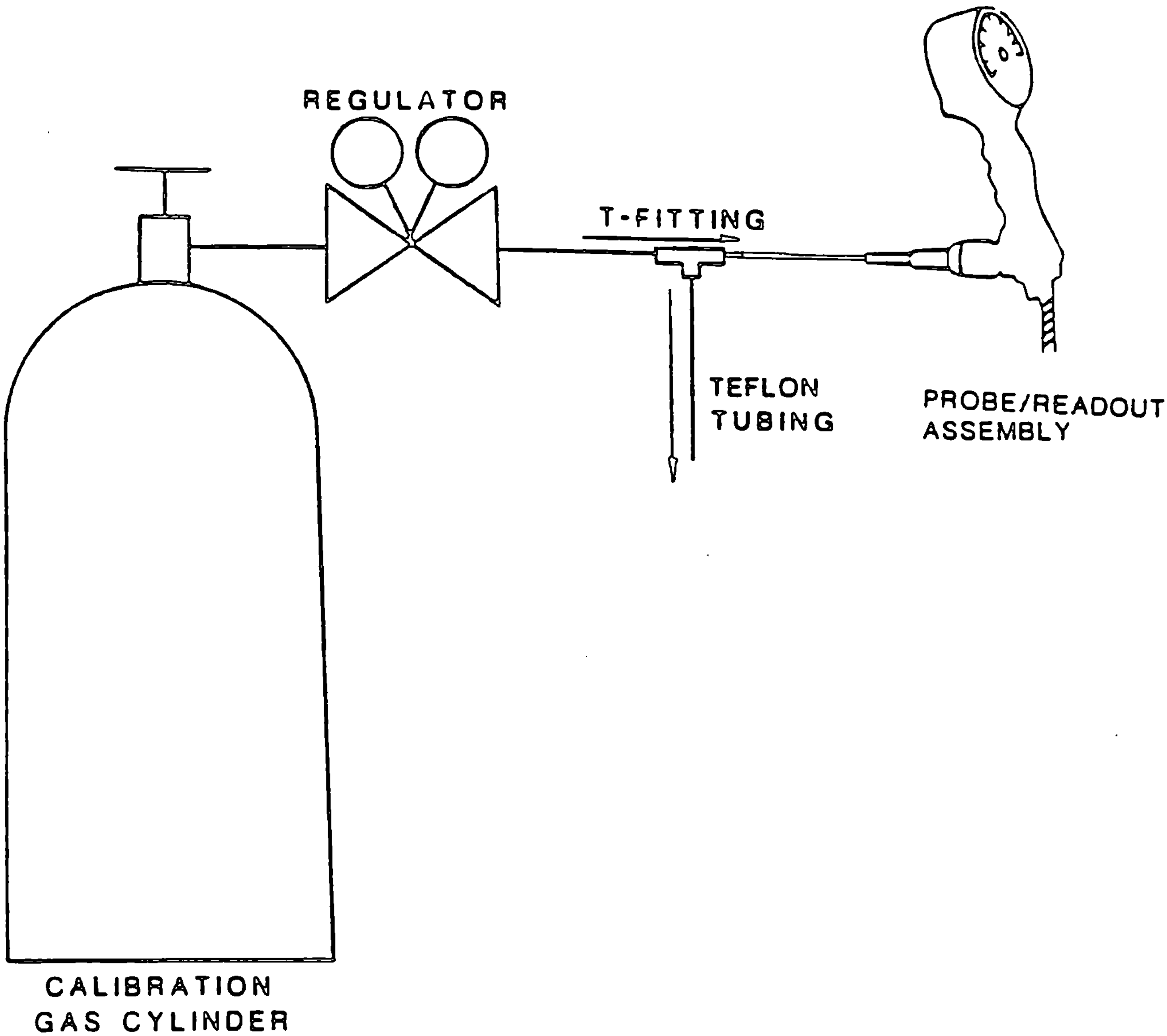
When finished, move the charger switch to OFF and disconnect from the side pack assembly.

11.0 Documentation

Safety and survey monitoring with the OVA will ge documented in a bound field log book and retained in the project files. The following information is to be recorded:

- Project name and number.
- Operator's signature.
- Date and Time of operation.
- Calibration gas used, the compound which the instrument is calibrated to, and the GAS SELECT setting.
- Meter readings (monitoring data obtained) and location of points surveyed.
- Instances of erratic or questionable meter readings, and corrective actions taken.
- Instrument response verifications - magic marker (Section 5) or similar test.

FIGURE 6-1


REGULATOR
T-FITTING
TEFLON TUBING
PROBE/READOUT ASSEMBLY
CALIBRATION GAS CYLINDER

Title: Operation/Calibration of HNU Photoionization Analyzer

1.0 Introduction

The HNU is primarily used by ERT personnel for safety and survey monitoring of ambient air, determining the presence of volatiles in soil and water, and detecting leakage of volatiles.

Personnel responsible for using the HNU should first read and thoroughly familiarize themselves with the factory operator instruction manual.

2.0 Principle of Operation

The HNU is a non-specific vapor/gas detector. The hand-held probe houses a photoionization detector (PID), consisting of an ultraviolet (UV) lamp and two electrodes, and a small fan which pulls ambient air into the probe inlet tube. All organic and inorganic vapor/gas compounds having ionization potentials (IP) lower than the energy output of the UV lamp are ionized; and the resulting potentiometric change is seen as a needle deflection, proportional to vapor concentration, on the potentiometer of the readout/control box.

3.0 Specifications

Detection range*:	0.1 to 2,000 ppm.
Linear range*:	0.1 to 400 ppm.
Response time:	3 seconds to 90% full scale deflection.
Operating temperature:	-10°C to 40°C.
Operating time on battery, continuous use, without recorder:	approximately 10 hours; at lower temperatures time is reduced.
Recharge from full discharge:	full recharge 12-14 hours.

* When equipped with 10.2 eV probe with SPAN set at 9.8 and measuring benzene. Values may vary for other compounds and conditions.

4.0 Required Materials

- Calibration Gas: Compressed gas cylinder of isobutylene in air or similar stable gas mixture of known concentration. The selected gas should have an ionization potential similar to that of the vapors to be monitored, if known. The concentration should be at 50-75% of the range in which the instrument is to be calibrated.

- Regulator for calibration gas cylinder
- Approximately 3-4 feet of teflon tubing
- "Magic Marker"

5.0 Preliminary Steps

Preliminary steps (battery charging, check-out, calibration, maintenance) should be conducted in a controlled or non-hazardous environment.

The sensor probe is carried separately in the instrument carrying case. For most safety and survey work, the 10.2 eV probe is used, as it detects more compounds than the 9.5 eV probe and is more durable than the 11.7 eV probe. Unclamp the cover from the readout/control box and remove the inner lid from the cover. Screw the inlet tube onto the sensor probe. Attach the probe cable plug to the 12 pin keyed socket on the readout panel by matching the alignment slot in the plug to the key in the connector, and screwing down the probe connector until a distinct snap and lock is felt.

Turn the function switch to the BATT (battery check) position. The meter needle will deflect to the green zone if the battery is fully charged. If the needle is below the green arc or if the low battery indicator comes on, the battery must be recharged (Section 9.0) before the analyzer is used.

Turn the function switch to the STANDBY position and allow the electronics to warm up for five minutes. Next turn the ZERO adjustment knob until the meter needle is at zero.

6.0 Operation

Turn the function switch to the appropriate range. Check to see if the intake fan is functioning; if so, the probe will vibrate slightly and a distinct sound will be audible when holding the probe casing next to the ear. Also, verify that the UV lamp is on by briefly looking into the probe from a distance greater than six inches to observe a purple glow.

WARNING: Continued exposure to ultraviolet energy generated by the light source can be harmful to eyesight.

At the beginning of each day, check the calibration (Section 7.2) and make adjustments if necessary (Section 7.3). Record the calibration information in the field log book.

The instrument is now operational. Readings should be taken on the lowest possible scale and recorded in the field log book.

When the HNU is not being used or between monitoring intervals, the function switch should be set on the STANDBY position to conserve battery power and UV lamp life.

At the end of each day, recheck calibration (Section 7.2) and record the information in the field log book.

To shutdown the HNU, turn the function switch to OFF.

Recharge the battery after each use (Section 9.0).

When transporting, disconnect the probe cable connector from the control panel and return the instrument to its stored condition.

7.0 Calibration Procedures

7.1 Start-Up

Battery Check (Section 5.0).

Zero Set (Section 5.0).

For measurement on the 0-20 or 0-200 ranges only one calibration gas standard is required. Calibration on the 0-200 range will provide accurate values on the 0-20 range as well. Connect the probe tip to the gas cylinder regulator, observing safety precautions, in order that the gas is delivered to the probe at atmospheric pressure (Figure 7-1). A t-fitting and plastic tubing can be used. Adjust the regulator so that the gas is delivered at 150-200 cubic centimeters per minute. The fan inside the probe draws approximately 100 cc/min.

7.2 Calibration Check

Set the function switch to the proper range setting, based on the calibration gas used, and record the meter reading in the field log book. Also record the calibration gas composition and concentration, the date and the time.

7.3 Calibration Adjustment

If adjustment is necessary, turn the span as required to read the ppm concentration of the gas standard, or the equivalent concentration of benzene if the HNU is being calibrated to benzene.

Recheck the zero setting (Section 5.0)

If reajustment of the zero setting is necessary, repeat the span adjustment. Record the span setting and the new meter reading. Whenever the span is changed, the zeroing procedure should be repeated.

If calibration cannot be achieved or if the span setting resulting from calibration is 0.0, then the lamp must be cleaned (Section 10.0).

7.4 Alternate Calibration Technique

It may be more convenient in certain circumstances to employ the use of a Tedler bag filled with calibrant instead of a calibration cylinder. In that case, the bag (usually 3-10 liter capacity) should be filled with the appropriate calibrant and brought to the HNU. The HNU probe should be connected to the discharge fitting on the bag using a piece of flexible tubing. Allow the HNU to draw the calibrant from the bag and follow the instructions as indicated in 7.2, 7.3.

8.0 Troubleshooting Tips

One convenient method for periodically confirming instrument response is to hold the sensor probe next to the tip of a magic marker. A significant needle deflection should be observed within 3 seconds with the function switch set at 0-20 (after shave lotion or cologne also will make the needle deflect).

Air currents or drafts in the vicinity of the probe tip may cause fluctuations in readings.

A fogged or dirty lamp (Section 10.0), due to operation in a humid or dusty environment, may cause erratic or fluctuating readings.

Moving the instrument from a cool or air-conditioned area to a warmer area may cause moisture to condense on the UV lamp and produce unstable readings (Section 10.0).

A zero reading on the meter should not necessarily be interpreted as an absence of air contaminants. The detection capabilities of the HNU are limited to those compounds which will be ionized by the particular probe used.

Many volatile compounds have a low odor threshold. A lack of meter response in the presence of odors does not necessarily indicate instrument failure.

If a negative deflection of the HNU meter is noted the ion chamber is dirty and needs cleaning. The chamber may be soaked in a solvent such as methanol in a soil bath air dried and then baked for two to four hours at a temperature of 100°C and not exceeding 105°C.

When high concentrations of hydrocarbons enter the ionization chamber in the HNU a "quenching" effect takes place. Typically, it is noted by a sharp needle movement once the flow of gas is pierced by the HNU probe. Within one to two seconds the needle fades to zero point. To check whether or not the quenching effect is taking place, move the HNU probe to just outside the hole created in the foil. Get another reading after five to ten seconds. If quenching is taking place a very eradic needle movement will occur. Once an operator has seen this phenomena it is fairly easy to recognize.

9.0 Battery Charging

The battery charger is stored inside the instrument cover. To charge the battery, first insert the mini plug of the charger into the jack on the side of the meter, with the function switch in the OFF position. Next, insert the charger plug into a 120VAC single phase, 50-60 HZ outlet. To ensure that the charger is functioning, turn the function switch to BATT. The meter should deflect full scale. The sensor probe cable must be connected to the control panel for a battery check response. For normal battery charging, leave the function switch in the OFF position. The battery is fully charged after 14 hours of charging. The charger can be left on indefinitely without damage. Disconnect the charger from the electrical outlet before disconnecting the mini plug from the instrument.

With the function switch turned to the appropriate range setting, the HNU may be operated while recharging.

10.0 Probe Cleaning

During periods of operation, moisture, dust, or other foreign matter can be drawn into the probe and form deposits on the surface of the UV lamp and ion chamber. This causes interference with the ionization process and produces erroneous readings. This condition is indicated by meter readings that are low, erratic, unstable, non-repeatable, or drifting. In most cases, the following field cleaning procedure is sufficient to correct this condition.

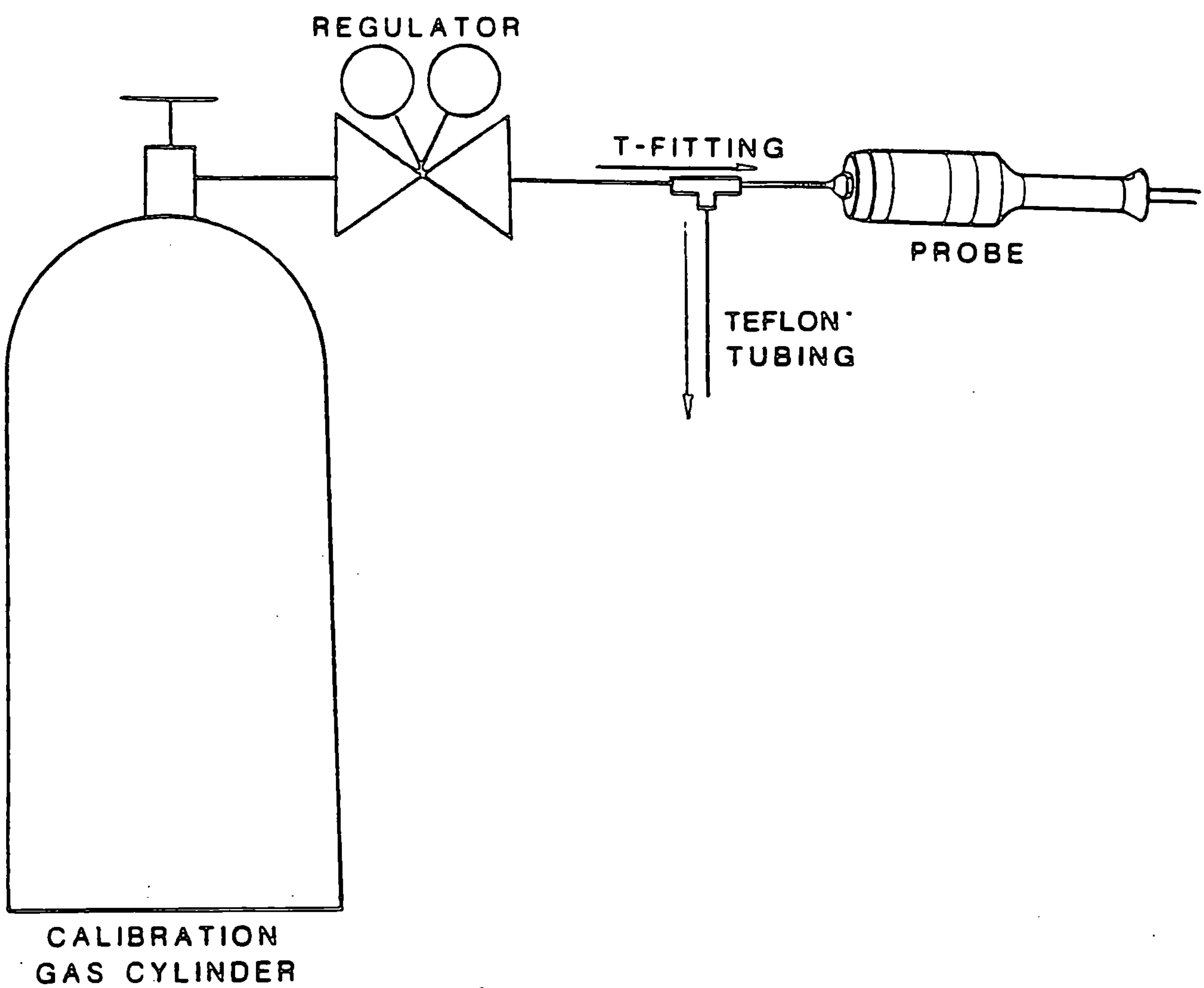
Turn the function switch to the OFF position. Disconnect the probe cable connector at the readout panel. Unscrew the probe inlet tube from the end cap and clean the inside of the tube making sure that the tube is dry and lint-free when finished. A pipe cleaner, or a kim-wipe and piece of wire, can be used. Keeping the probe upright, remove the two screws holding the end cap in place and remove the cap and ion chamber. Place one hand over the top of the lamp housing and tilt slightly. The light source will slide out of the housing. Take care not to lose or misplace o-rings or other parts. Do not touch the internal parts of the probe, particularly the UV lamp, with the bare hand during cleaning or reassembly. Surgical gloves are recommended. Clean the internal parts with a non-abrasive, lint-free paper towel (e.g., kim-wipe) and reassemble the probe.

11.0 Documentation

Safety and survey monitoring with the HNU will be documented in a bound field log book and retained in the project files. The following information is to be recorded:

- Project name and number.
- Operator's signature.
- Date and time of operation.
- Calibration gas used.
- Calibration check at beginning and end of day (meter readings before adjustment).
- Span setting after calibration adjustment.
- Meter readings (monitoring data obtained).
- Instances of erratic or questionable meter readings and corrective actions taken.
- Instrument response verifications - magic marker (Section 8.0) or similar test.

Figure 7-1


REGULATOR
T-FITTING
PROBE
TEFLON
TUBING
CALIBRATION
GAS CYLINDER

ATTACHMENT B

STANDARD OPERATING PROCEDURE

Title: Decontamination

Date: 1st Qtr 1984
Number: 7600
Revision: 1

1.0 General Applicability

This SOP describes the methods to be used for the decontaminization of all field equipment which becomes potentially contaminated during a sample collection task. The equipment may include split spoons, bailers, trowels, shovels, hand augers, or any other type of equipment used during field activities.

Decontamination is performed as a quality assurance measure and a safety precaution. It prevents cross-contamination between samples and also helps to maintain a clean working environment for the safety of all field personnel involved, including the environment.

Decontamination is mainly achieved by rinsing with liquids which include: soap and/or detergent solutions, tap water, deionized water, and methanol. Equipment will be allowed to air dry after being cleaned or may be wiped dry with chemical free cloths or paper towels if immediate re-use is needed.

The frequency of equipment use, dictates that most decontamination be accomplished at each sampling site between collection points. Waste products produced by the decontamination procedures such as waste liquids, solids, rags, gloves, etc. will be collected and disposed of properly based on the nature of contamination. All cleaning materials and wastes should be stored in a central location so as to maintain control over the quantity of materials used and/or produced throughout the study.

2.0 Responsibilities

It is the primary responsibility of the site operations manager to assure that the proper decontamination procedures are followed and that all waste materials produced by decontamination are properly stored and disposed of.

It is the responsibility of the project safety officer to draft and enforce safety measures which provide the best protection for all persons involved directly with sampling and/or decontamination.

It is the responsibility of any subcontractors (i.e., drilling contractors) to follow the proper, designated decontamination procedures that are stated in their contracts and outlined in the Project Health and Safety Plan.

It is the responsibility of all personnel involved with sample collection or decontamination to maintain a clean working environment and to ensure that any contaminants are not negligently introduced to the environment.

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3.0 Supporting Materials

- cleaning liquids: soap and/or detergent solutions, tap water, deionized water, methanol
- personal safety gear (defined in Project Health and Safety Plan)
- chemical-free paper towels
- disposable gloves
- waste storage containers: drums, boxes, plastic bags
- cleaning containers: plastic buckets, galvanized steel pans
- cleaning brushes

4.0 Methods or Protocol for Decontamination

4.1 General Procedures

4.1.1 The extent of known contamination will determine to what extent the equipment needs to be decontaminated. If the extent of contamination cannot be readily determined, cleaning should be done according to the assumption that the equipment is highly contaminated until enough data are available to allow assessment of the actual level of contamination.

4.1.2 Adequate supplies of all materials must be kept on hand. This includes all rinsing liquids and other materials listed in Section 3.0.

4.1.3 The standard procedures listed in the following section can be considered the procedure for full field decontamination. If different or more elaborate procedures are required for a specific project, they will be spelled out in the project work plan. Such variations in decontamination may include following all, just part, or an expanded scope of the decontamination procedure stated herein.

4.2 Standard Procedures

4.2.1 Remove any solid particles from the equipment or material by brushing and then rinsing with available tap water. This initial step is performed to remove gross contamination.

4.2.2 Wash equipment sampler with the soap or detergent solution.

4.2.3 Rinse with tap water

4.2.4 Rinse with deionized water

4.2.5 Rinse with methanol

4.2.6 Repeat entire procedure or any parts of the procedure if necessary

4.2.7 Allow the equipment or material to air dry before re-using

4.2.8 Dispose of any soiled materials in the designated disposal container

5.0 Specific Decontamination Procedures

5.1 Submersible Pump

5.1.1 Applicability

This procedure will be used to decontaminate submersible pumps between ground-water sample collection points and at the end of each day of use.

5.1.2 Materials

- plastic-nalgene upright cylinder
- 5-10 gallon plastic water storage containers
- methanol and dispenser bottle
- deionized water and dispenser bottle
- chemical free paper towels

5.1.3.1 During decontamination the submersible pump will be placed on a clean surface or held away from ground.

5.1.3.2 When removing the submersible pump from each well the power cord and discharge line will be wiped dry using chemical-free disposable towels.

5.1.3.3 Clean the upright plastic-nalgene cylinder with first a methanol and then a deionized water rinse, wiping the free liquids after each.

5.1.3.4 Reverse pump backwashing all removable residual water present in the pump tubing. The pump should be shut off as soon as intermittent flow is observed from the reverse discharge.

5.1.3.5 Rinse the stainless steel submersible down hole pump section with a liberal application of methanol and wipe dry.

5.1.3.6 Place the submersible pump section upright in the cylinder and fill the cylinder with tap water, adding 50-100 ml of methanol for every one liter of water.

5.1.3.7 Activate the pump in the forward mode withdrawing water from the cylinder.

5.1.3.8 Continue pumping until the water in the cylinder is pumped down and air is drawn through the pump. At this time air pockets will be observed in the discharge line. Shut off the pump immediately.

5.1.3.9 Remove the pump from the cylinder and place the pump in the reverse mode allowing that all removable water be discharged on to the ground surface as discussed in Step 2.

5.1.3.10 Using the water remaining in the cylinder, rinse the sealed portion of the power chord and discharge tube by pouring the water carefully over the coiled lines.

5.1.3.11 When reaching the next monitoring well place the pump in the well casing and wipe dry both the power and discharge lines with a clean paper towel as the pump is lowered.

5.1.4 Quality Assurance

To assure that decontamination is complete, field blank samples shall be collected using the cleaned submersible pump. These field blanks will be subsequently analyzed for the parameters of interest with respect to the ground water.

The procedure for collecting the field blanks will comprise using the pump to withdraw the tap water used for decontamination, from the plastic cylinder to sample containers. This field blank sample collection procedure shall only be performed after the materials to be used have been decontaminated.

ATTACHMENT C

EMERGENCY RESPONSE CONTACTS AND TELEPHONE NUMBERS

LOCAL EMERGENCY CONTACTS

Ambulance Service	911
Police	911
Fire	911

Hospital: Los Angeles County/
Harbor UCLA Medical Center . . . . . (213) 533-2345

Location: 1000 W. Carson Street
Torrance, California

Directions: Head south on Normandie to Carson Street. The center is located on the corner of Normandie and Carson.

HAZARDOUS MATERIALS INFORMATION

EHA-INFO	(800) 342-4636
Toxline	(301) 496-1131
CHEMTREC (24-hour, emergency only)	(800) 424-9300
ORNL, Toxicology Information Response Center	(615) 576-1743
Poison Control Center	(800) 682-9211

ENSR CONTACTS

Rich Richter, Project Manager	(714) 476-0321
Mark Wood, Site Manager and Safety Coordinator	(714) 476-0321
Alice Armstrong, Regional Health & Safety Mgr	(805) 388-3775
Onsite Telephone	(213) 329-6379

STANDARD PROCEDURES FOR REPORTING EMERGENCIES

When calling for assistance in an emergency situation, the following information should be provided:

- Name of person making call.
- Telephone number and location of person making call.
- Name of person(s) exposed or injured and location.
- Nature of emergency and type of exposure, when appropriate.
- Actions already taken.

Never hang up first when calling for emergency assistance. Wait for the dispatch operator to finish all questions.

ATTACHMENT D

HEALTH AND SAFETY PLAN
SIGNOFF SHEET

for the

AMOCO CHEMICAL COMPANY SITE

TORRANCE, CALIFORNIA

ENSR Project No. 0350-004-100

I have received a copy of the Health and Safety Plan prepared for the above-referenced site. I have read and understand its content, and I agree that I will abide by its requirements.

____
Name

____
Signature

____
Company

____
Date

___-___-___

ENSR

APPENDIX B

STANDARD OPERATING PROCEDURE 7115

SUBSURFACE SOIL SAMPLING

1.0 General Applicability

This SOP describes the methods used in obtaining subsurface soil samples for identification of soil grain-size distributions, stratigraphic correlations, and chemical analysis (if required). Subsurface soil samples are obtained in conjunction with soil boring and monitoring-well installation programs and provide direct information as to the physical makeup of the subsurface environment. This SOP covers subsurface soil sampling by split-spoon only, as this is the means most often used for obtaining samples from unconsolidated deposits. (See also, SOP 7220 - Monitoring Well Construction).

2.0 Responsibilities

It shall be the responsibility of the contract driller to provide the necessary materials for obtaining subsurface soil samples. This includes the split-spoon sampler and sample containers (sized according to project requirements) as well as the appropriate boring logs. It is the contract driller's responsibility to maintain a complete set of boring logs for the record. Standard Penetration Tests (SPT) (ASTM: 1586-67) will be conducted by the contract driller if required by the project. Equipment decontamination shall also be the responsibility of the driller.

It shall be the responsibility of the project geologist/engineer to observe all activities pertaining to subsurface soil sampling to ensure that all the standard procedures are followed properly, and to record all pertinent data on a boring log. It is also the geologist/engineer's responsibility to indicate to the contract driller at what specific depth samples shall be collected. The geologist/engineer will maintain custody of all samples until they are shipped or delivered to their appropriate destination.

3.0 Supporting Materials

In addition to those materials provided by the contract driller, the geologist/engineer will provide:

- sample bottles and labels
- boring logs
- field notebook
- chain-of-custody forms and tape

4.0 Methods or Protocol for Use

4.1 General Procedures

The sampling depth interval is typically one (1) sample per every five (5) vertical feet with additional samples taken, at the discretion of the project geologist/engineer, when significant textural, visual or odor changes are encountered.

The following are the standard procedures to be used in advancing casing and obtaining soil samples.

Specific requirements described in a project's task plan may call for deviations in the standard procedures but these will be taken into account on a project by project basis. Any deviations from specified procedures will be recorded on the boring log or into a field notebook.

4.2 Standard Procedures - Advancing Casing

4.2.1 The casing shall be advanced to the required depth. All loose material within the casing shall be removed prior to sampling. The casing shall be advanced according to project requirements. Borings are typically advanced by two methods, drive-and-wash casing, and hollow-stem augering. The casing shall be of the flush joint or flush couple type and of sufficient size to allow for soil sampling, coring, and/or well installation. All casing sections shall be straight and free of any obstructions. Hollow-stem augers or solid flight augers with casing may be used according to specific project requirements as described in the project task plan. If hollow-stem augers are to be used, the bit shall be equipped with a plug device to be removed at the required sampling depth.

4.2.2 For those borings which encounter obstructions, the casing shall be advanced either past or through the obstruction by drilling, mechanically fracturing, or blasting (if required). If the obstruction is bedrock, a rock core shall be taken according to project requirements and following the standard procedures for rock coring (SOP # 7210).

4.2.3 The use of recirculated water shall not be permitted when casing is being driven, unless specified in the project task plan, directed and properly documented (in field notebook, logs) by the geologist/engineer.

4.2.4 If recirculated water is used all loose material within the casing shall be removed by washing to the required sampling depth using a minimum amount of water. Care shall be taken to limit recirculation of the wash water to those times when the water supply is extremely limited or unavailable.

4.3 Standard Procedures - Soil Sampling

4.3.1 Subsurface soil samples shall be obtained using a split-tube type sampler (split spoon) having a 2-inch O.D. with a corresponding 1 3/8-inch I.D. and a 18- or 24-inch long sample capacity. It shall be equipped with a ball check valve and may require a flap valve or basket-type retainer for loose-soil sampling. Sampling frequency will be as stated in Section 4.1, or as otherwise specified in the project task plan.

4.3.2 Sampling depth shall be independently determined by the inspecting geologist, and any discrepancies shall be resolved prior to obtaining the sample.

4.3.3 Samples shall be obtained using the standard penetration test (SPT), which allows for determination of resistance within the deposits. The sampler shall be driven using a 140-pound hammer with a vertical drop of 30-inches using 1 to 2 turns of the rope on the cathead. A certificate indicating exact weight may be required for documentation purposes. The number of hammer blows required for every 6 inches of penetration shall be recorded on the boring log.

4.3.4 The sampler shall be immediately opened upon removal from the casing. If the recovery is inadequate, another attempt shall be made before drilling progresses. Adequate recovery should be no less than 12 inches, not including any residual wash material brought up with the sample.

4.3.5 The sample shall be split if necessary, placed in the appropriate container, labelled, and placed in the storage box. The boring log and the sample container/label should contain the following information for each sample: site name, boring location, depth, blow counts, recovery, sample number and collection date. The type of material shall be indicated in the boring logs and will be described using the Unified Soil Classification System (ASTM: D2487-69 and D2488-69).

4.3.6 The sampler shall be cleaned with water between attempts in order to prevent cross-contamination. If further decontamination is required, SOP 7600 shall be consulted.

4.3.7 Proper procedures for delivery to the designated laboratory shall be initiated when all samples are collected. This includes packaging, shipping with sample logs, analysis request forms, and chain of custody forms.

5.0 Documentation

Various forms are required to ensure that adequate documentation of each sample is followed and will include:

- sample logs
- boring logs
- chain of custody forms
- shipping forms

In addition, a field log book will be kept as an overall log of all samples collected throughout the study. All documents are retained in the appropriate project files idefinitely. It is important that all field documentation be as complete as possible to ensure traceability (QA/QC requirements).

Project ______ Site ______ BORING ______ Sh 1 of ____
Date Started ______ Completed ______ Ground Elevation ______
Total Depth ______ Location ______ Logged by ______
Casing I.D. ______ Contractor ______
Remarks ______

Elev. Feet	Depth Feet	Sample				Graphic Log	Sample Description	Equipment Installed
		Type & Number	Blows per 6 In.	Depth Range	Rec.			

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APPENDIX C

STANDARD OPERATING PROCEDURE 7300

FIELD GAS CHROMATOGRAPHY

1.0 Purpose and Applicability

This SOP details the considerations necessary to conduct field analytical screening of organic contaminants using a portable gas chromatograph (GC). The scope of this SOP is limited to general procedures necessary to properly understand and organize field screening programs and to ensure that the collected data are of acceptable quality.

2.0 Definitions

Gas Chromatography - A method of separating the constituents of a sample for subsequent identification and quantification. A sample is injected into the instrument where it is volatilized and carried through a separating column by an inert carrier gas. Each separated component leaves the column and enters the detector where it creates an electronic signal.

Chromatographic Column - The separation of sample components is achieved in the chromatographic column. The column consists of a tube whose tendency to retain or pass a compound carried into it by a carrier gas stream will vary depending on properties of the compound. The tube may be either glass, stainless steel or Teflon®. Two types of analytical columns exist - packed columns and capillary columns.

Carrier Gas - The gas used to transport a gaseous sample through a chromatographic column to the detector of a gas chromatograph. In the Photovac Model 10S50 this air must contain less than 0.1 ppm total hydrocarbons. This type of gas is commonly referred to as "ultra zero grade" or "hydrocarbon free" air. "Zero grade" air is not recommended by Photovac.

Electron Capture Detector (ECD) - A detector in which a voltage is produced through ionization of a special carrier gas, usually nitrogen or argon/methane, and organic compounds (esp. PCBs, alkyl halides, carbonyls, nitriles, nitrates, and organometals) are detected through their capacity to absorb electrons and therefore impede electrical current. The resulting reduction in electrical current is monitored by an electrometer and is displayed as a positive signal on a meter or strip chart recorder. The detector is virtually insensitive to aliphatic hydrocarbons, alcohols, and ketones.

Flame Ionization Detector (FID) - A detector in which molecules are ionized in a hydrogen flame. The ions and electrons formed decrease electrical resistance in a gap between two electrodes and permit the flow of current, which is amplified and displayed on a meter or strip chart recorder.

Photoionization detector (PID) - A detector that uses an ultraviolet light source to ionize individual constituents. Gaseous contaminants are ionized as they emerge from the column and the ions are then attracted to an oppositely charged electrode, resulting in an electrical current which is amplified and measured on a numerical scale (meter readout) or recorded on paper (strip chart).

Headspace - The air space above a soil or aqueous sample in a closed container into which organic compounds can volatilize. For example, when a VOA vial is three quarters filled with water or soil, the remaining quarter of the vial is headspace. The air from the headspace (after agitation) is sampled in the portable GC. Only gaseous headspace (no liquids) normally can be injected into portable GCs because of the absence of heated injection ports. CAUTION: The Photovac 10S00 series of portable GCs cannot accept liquid samples.

Retention Time - The total time required for a chemical component to elute off a chromatographic column. The retention time is measured from the time of injection until detector response.

Standard - A known reference chemical compound. The standard can be in a vapor state in a VOA vial or in a Tedlar® bag. If the portable GC is equipped with heated injection ports, standards in distilled water or methanol can be used. The concentration of the standard is usually known and, if so, can be used to perform quantitative analysis. After the vial has been agitated and the headspace has reached equilibrium with the liquid, a syringe is used to withdraw a predetermined volume of the headspace gas. The headspace aliquot can then be injected onto the column for chromatographic analysis. Comparison of the retention times of the standard to the retention time of unknown sample peaks tentatively identifies the unknown sample peaks.

Muffled Soil - Soil that has been baked in a 400° muffle furnace for 4 hours to remove volatile organics.

Volatile Organic Compounds (VOC) - Hydrocarbon-based chemicals that are characterized by low boiling points and high vapor pressures.

Elute - To remove sorbed materials (chemicals) from a sorbent (column) by means of a carrier gas. A compound is said to elute when it emerges from the outlet end of the chromatographic column into the detector.

Ionization Potential (IP) - The energy level at which ionization of a compound occurs. This is generally expressed as electron volts (eV).

3.0 Health and Safety Considerations

Health and safety considerations are dependant on site logistics, the nature of the contaminated material, the chemical parameters to be analyzed, and the type of gas chromatograph. The manufacturer's instructions and the project Health and Safety plan should be consulted for specific requirements.

Standard laboratory safety practices should be followed when handling chemicals and using equipment (e.g., syringes, compressed gas cylinders). Appropriate personal protection should be worn when necessary. If a mobile laboratory is used, the laboratory should be adequately ventilated and properly equipped (e.g., fire extinguisher, eyewash, spill kit).

4.0 Quality Assurance Planning

The following items depend on site logistics, site-specific chemistry, the nature of the contaminated media to be studied, and the objectives of the study. Each topic must be considered and addressed in the planning of the field program.

Basic Quality Assurance procedures for QC analyses are outlined in Section 9.0.

4.1 Training

All field technicians performing gas chromatography must be properly trained in the chromatographic principles employed, the project data objectives, sample preparation procedures, health and safety procedures and the project QA procedures.

4.2 GC Laboratory Environment

When specific concentration data are needed, non-portable GC equipment can be set up in a mobile laboratory. The mobile laboratory may be inside a van or office trailer. Consequently, the space which will be available in vehicles at the site must be carefully considered, as it may dictate the type of GC which will be used to perform analyses. Unless mobility is critical to the field program, it is preferable to establish the field laboratory inside a building at the site, if one is available.

Laboratory type gas chromatographs, like other electronic instrumentation, function best in a temperature-controlled environment. The colder the ambient temperature, the longer it takes for the instrument to warm up, and the slower the instrument response time. In addition, operational problems are encountered more frequently at extremely high or low ambient temperatures. It is therefore best to operate the instrument in an environment which comes as close to the range of 55°F - 80°F as possible. If analyses are being performed in the back of a van, it may be necessary to have the vehicle's heat or air conditioning on continuously in order to maintain the air temperature. However, the vehicle's exhaust emissions must be vented away from the analytical activities, or severe background interference may be experienced. For long-term projects conducted in the winter or summer, it may be necessary to conduct analyses in a heated or air-conditioned insulated trailer.

When using laboratory instruments without a heated column in a field office, changes in ambient temperature will result in changes in compound retention times. Therefore, the ambient temperature should be monitored, and precautions taken to minimize fluctuations in the temperature of the operating environment. For instance, the GC should not be placed near the door of the vehicle, near the heating unit, or near the air stream from an air conditioner.

4.3 Calibration Standards

The analysis of standards serves two purposes essential to successful gas chromatography:

1) establishment of column retention time windows for target compounds to facilitate their identification; and
2) development of response factor data that can be used in quantifying responses observed during sample analyses.

To achieve the first objective, standard mixes must contain measurable quantities of all of the compounds to be identified. Further, it must be remembered that slight changes in column conditions (e.g., temperature, carrier gas flowrate) can produce dramatic changes in retention times. Retention time standards should be analyzed frequently if column conditions are not constant.

The second objective requires that the concentrations of the calibration standards be accurately known. For some detectors (e.g., PID) reliable relative response information exists that can be used to determine the response factor of one compound from the response factor of another. For example, if a GC/PID is being used to measure benzene, toluene and xylene, the calibration standard should contain all three compounds, but only the concentration of benzene in the calibrant need be accurately known. Response factors for toluene and xylene can be derived from the benzene response factor using experimentally proven relative response data. This may be done only when reliable relative response data exists.

Standards used in the field should be:

- of the same medium (matrix) as the samples
- in a range of concentrations, such that one standard has approximately the same concentration as is expected in samples, and one standard is just above the expected limit of detection. At least one additional standard having a concentration between the other two should be included to monitor linearity.

When only relative concentration data are needed, such as when performing soil gas sampling, pre-packaged standards may be used. Another approach is to add a known aliquot of a compound of interest (or the actual product being sought in the soil) to a Tedlar bag filled with carrier gas.

4.4 Equipment

<u>Instruments</u>

There are numerous gas chromatographs on the market; the choice of instrument will depend on the analytes of interest, field conditions, and space limitations. Instruments not available within ENSR may be leased from outside vendors. Adequate planning is required in order to be certain that the desired instrument will be available when needed. Portable and transportable gas chromatographs are available with a wide variety of options.

Ovens

Analyses can be run on a heated column by using either an isothermal or temperature-programmable oven. Heated columns will shorten analysis time; and since the temperature is held constant, a heated column will help to eliminate the changes in retention times associated with changing ambient air and column temperature. For certain analyses, such as a mixture of PCBs, it is advantageous to use temperature programming during the course of an analysis to decrease the retention time of slow-eluting compounds (e.g., Aroclor 1260).

Output

Output from the gas chromatograph can go to either a strip chart recorder or an integrator, either of which may be integral to or separate from the instrument. An integrator offers the advantage of more accurate peak quantitation and the ability to store calibration data. Use of a strip chart recorder necessitates manual measurement of peak heights and retention times, which can be time consuming. In the case of the Photovac Model 10S50, an onboard integrator outputs integrated peak heights in units of millivolts per second.

Input

Samples can be introduced into a GC via manual injection with a syringe (for one type of headspace analysis), or through automated sampling devices such as a pump (for air or soil gas sampling) or an auto sampler (for liquid samples in quantity). The device used will depend on the type of analysis being performed.

Columns

A packed column consists of a tube packed with an inert solid material supporting a thin film of nonvolatile liquid. Packed columns vary according to their length, diameter, and packing material. Packed columns may be made of teflon, stainless steel, or glass, generally have an outer diameter of 1/4 or 1/8 inch, and are usually about 4 to 6 feet in length. Packed columns may be used for either ambient or high temperature analyses; a stainless steel or glass column must be used when the column will be heated.

Capillary columns are composed of fused silica or borosilicate glass, vary in length from 15 to 30 meters, and vary in inner diameter from 0.25 mm to 0.75 mm. Capillary columns are generally used in conjunction with an oven. Capillary columns do not contain a packing material, but rather a thin film or coating on the inner wall which acts similarly to retain compounds in the column. Capillary columns yield sharper peaks and better resolution than packed columns. They are used when it is necessary to attain high resolution of a mixture of different compounds.

It is difficult to predict which type of column will yield a faster analysis time. Analysis time depends on the length and temperature of the column, the flow rate of the carrier gas, and the density of the packing material.

The reader should refer to a catalogue of chromatography supplies (e.g., Supelco), or the specific operating guidelines for the instrument being used, in order to determine which type of column would be most suited to a given application.

Detectors

The choice of detector for a given instrument depends on the analytes of interest. Photoionization detectors (PID) are used for analysis of volatile organics, particularly aromatics. Flame ionization detectors (FID) are used for analysis of a wide variety of volatile and semi-volatile organic compounds. Electron capture detectors (ECD) are used for the analysis of halogenated compounds, particularly PCBs, pesticides, and chlorinated solvents. The type of detector desired is likely to be the main factor in determining instrument choice, as many portable field GCs do not have interchangeable detectors.

Automatic Programming

The Photovac 10S50 model portable GC is controlled by an onboard computer, programmable by the instrument operator. It is critical to assure that the program being used is compatible with the objectives of the sampling effort.

5.0 Responsibilities

The project manager is responsible for:

- organizing all of the instrumentation, supplies, and instruction manuals necessary to conduct analyses in the field;
- ensuring that all personnel scheduled to perform field analyses have been properly trained in sample preparation, instrument operation, and quality assurance procedures;
- maintaining proper records of all field screening data generated;
- ensuring that equipment and procedures are applied in a technically valid manner.

The field technician is responsible for:

- proper operation and calibration of instrumentation in accordance with equipment manuals and the project work plan;
- complete and accurate documentation of field activities, including sampling methods, instrument calibrations, and analysis results.

The equipment coordinator is responsible for:

- Storage of equipment in a limited access area;
- Issuance of equipment to project personnel;
- Maintenance of equipment in accordance with the manufacturer's recommended schedule and procedures;
- Documentation of equipment repairs, preventive maintenance, and use.

6.0 Applications

Common applications of field screening using portable gas chromatographs are air monitoring, soil gas monitoring, and screening of soil and water samples. Headspace analysis can be used during drilling of monitoring wells to obtain information about the vertical distribution of contaminants. Analysis of ambient, or breathing zone air samples can be used to monitor the safety of personnel in a work area. Screening of volatiles in soil is of use during soil excavation, as it provides an onsite determination of when the excavation has reached an acceptable level of contamination (contaminant concentration). In some cases it is also practical to use similar methods in combination with simple extraction procedures to screen for certain semi-volatile compounds (eg., PCBs).

Soil gas sampling can be accomplished using a specially designed vapor probe which is manually inserted into the soil. This technique is useful in cases where heavy equipment used to conduct soil borings would not be appropriate. This type of field screening is useful for determining the relative contaminant concentrations (nondetectable, low, medium, high) at sites. This is a cost-effective approach to collecting data for detecting volatile contamination and for directing soil boring locations.

Field screening data are best used to determine the presence or absence of detectable quantities of certain materials, and to develop general information about their distribution at a site. Limitations inherent in field screening techniques include the following:

- This method does not provide definite identification of specific constituents (compound-specific data).
- Generally, only qualitative or semi-quantitative screening data can be obtained. Preparation and analysis of accurate standards can be difficult under field conditions.

Sample concentrations obtained through field screening with a portable gas chromatograph usually must be considered approximate, as they may vary dramatically from the "true" sample concentration, particularly near the detection limit.

If the gas chromatograph is equipped with an oven that controls column temperature, quantitative data can be obtained through careful calibration with certified standards.

7.0 Required Materials

The following list identifies the type of equipment and supplies which may be necessary to use gas chromatography in the field. Exact equipment needs will be project-specific and will be detailed in the technical instructions for each type of analysis and in the project-specific work plan. This will be particularly true for mobile laboratories.

- Portable gas chromatograph
- flowmeter
- carrier gas, with <0.1 ppm total hydrocarbons (usually in compressed gas cylinders)
- 2-stage regulator, or fill tube

- syringes (liquid and gas-tight with side-port needles)
- VOA vials for headspace analysis
- pre-prepared standards (air, headspace, or liquid)
- notebook for chromatograms
- thermometer (0-100°C)
- external battery for GC
- Tedlar bags
- soil gas probe and connective Teflon tubing

8.0 Procedures

8.1 Preparation of Standards

8.1.1 Air Standards

It is necessary to use an air standard when analyzing air samples or performing soil gas surveys. Air standards can either be made up by the GC operator, or purchased in pre-made calibrant gas canisters from a manufacturer. Pre-made calibrants in compressed gas cylinders are desirable, but often cannot be obtained for the appropriate compound(s) in the desired concentrations. It is often necessary to prepare calibrants in the field.

The technique of making air standards requires the use of a Tedlar gas-tight bag, a liquid syringe, a supply of high-purity compressed air (ultra-zero air), a flowmeter, a calculator, and a supply of the volatile organic compound of interest. This method is only feasible for standards containing volatile organic solvents, as the liquid must completely volatilize once it is injected into the bag.

Using this method, the Tedlar bag (or equivalent container from which samples can be taken with a syringe) is filled with a known quantity of high-purity air. To measure the quantity, the air should be fed from the compressed gas cylinder or pump through a flowmeter (e.g., dry gas meter), then through a charcoal column and into the bag. A dry gas meter will provide a direct volume measurement and does not require power. A known volume of clean air can also be obtained by using a calibrated battery-operated constant-flow pump (e.g., a personal sampling pump) to pump air through a charcoal column and into the Tedlar bag. Here, the volume is measured by pumping at a known flowrate for a known time interval, measured with a stopwatch. A third option is to use a calibrated critical orifice between the compressed gas cylinder regulator and the Tedlar bag. As long as sufficient pressure drop across the critical orifice is maintained throughout, the orifice's calibrated flowrate and the time interval (measured by stopwatch) will dictate the known volume.

A known quantity of the compound of interest is then injected into the bag and allowed to volatilize. The desired volume of standard is then withdrawn from the sampling port in the bag using a gas-tight syringe, and injected into the GC; or by connecting the bag directly to the calibrant intake on the GC (Photovac) with teflon tubing.

The problem with making standards in this manner is that it is difficult to ensure the standard concentration accuracy. The gas-tight bags may leak, or may be permeable to some gas constituents, and therefore may degrade with time. It is prudent to make up a fresh standard each day, and even so, a change in standard concentration may be noticed through the course of a day. In addition to inaccuracies due to the leaks and permeabilities, the actual amount of liquid solvent injected into the bag may vary due to a small amount of evaporation from the syringe needle before it is injected into the bag, or incomplete delivery of the solvent from the syringe.

The equation used to calculate the volume of a liquid standard that must be injected into a tedlar bag to produce the desired concentration gas standard is expressed as the following:

$$I = \frac{T \times M \times V_s}{D \times V_{m_1}} \times 10^{-3} \,{}^{*}$$

where:
- I = the required injection volume in μL
- T = the target concentration in ppm
- M = the molecular weight in g/mol
- V_s = the system (tedlar bag) volume in L
- D = the density of the liquid compound in g/ml
- V_{m_1} = the molar volume L/mol

*see figure 2 for derivation of calculation

Note 1: The molar volume must be corrected for temperature and pressure using the Ideal Gas Law, PV=RT. For example, the molar volume of any gas at 25°C and 1 atm (STP) is:

$$V = \frac{RT}{P}$$

where: V = volume L/mole
R = universal gas constant = (0.08206 liter atm/mol k)
P = pressure = atm
T = temperature degrees Kelvin

$$= \frac{(0.08206 \text{ liter atm/mol k})\ (298.15k)}{1 \text{ atm}}$$

$$= 24.47 \text{ L/mole}$$

The following is an example calculation to determine the volume of liquid trichloroethylene (TCE) that must be injected to produce a concentration of 25 ppm in a 10-L Tedlar bag.

Density of TCE = 1.4642 g/mL
Molecular weight of TCE = 131 g/mol
Temperature = 25°C
Pressure = 1 atm
Target concentration = 25 ppm
Tedlar bag volume = 10 L

$$I = \frac{(25) \times (131) \times (10)}{(1.4642) \times (24.47)} \times 10^{-3} = 0.91\ \mu L$$

Therefore the injection volume necessary to prepare 10 liters of a 25 ppm standard of TCE at 25°C and 1 atm would be 0.91 µL.

8.1.2 Headspace Standards

Aqueous headspace standards must be used when conducting headspace analysis on water or soil. Headspace analysis can only be used when analyzing for volatile organics, since these are the only compounds which will volatilize into the headspace in sufficient quantity for analysis at ambient conditions.

Aqueous headspace standards are made by mixing a known quantity of solvent(s) into a known quantity of deionized water or muffled soil. A 40-ml VOA vial is then filled with this standard, and using a plastic syringe, 10 ml of the liquid is withdrawn to create a 10 ml (25%) headspace in the vial. The vial should then be shaken for one minute prior to use as a calibrant to drive the volatiles into the headspace. Headspace standards are typically used in conjunction with soil sampling headspace analysis.

8.1.3 Liquid Standards (Solvent Extracts)

Liquid standards are made by mixing a known quantity of the compounds of interest in the appropriate organic solvent to simulate a solvent extract. This type of standard is used in semi-volatile organics analyses, because it is a solvent extract (compounds of interest dissolved in solvent) that is injected into the GC to analyze these samples. This kind of analysis should never be attempted with a Photovac 10S series GC, but can be performed with a Foxboro OVA in GC mode.

8.2 Instrument Calibration

At a minimum, standards should be analyzed at the beginning and end of each day of analysis. When specific concentrations are sought standards should also be analyzed every 2-3 hours over the course of the day, to check instrument response and determine if retention times have drifted. Samples should be quantitated using the standard which was run closest in time to the sample. The frequency of analysis of standards should be increased if instability is observed in the column or detector due to varying environmental conditions.

When quantitative (i.e., specific concentration) results are desired, it is necessary to calibrate the instrument with a range of standard concentrations, in order to check the linearity of the instrument response. If the instrument response is not linear, (i.e., increasing standard concentrations do not produce a proportionate increase in peak height) then samples should be quantitated using the response factor derived from the standard which is closest in concentration to the sample.

Duplicate injections of the standard should be made at the beginning of each day to check for reproducibility. Standard chromatograms should have duplicate peak heights (or areas, when an integrator is used) within 20% of each other and retention times within 5% of each other. If this stability goal is not achieved, causes of the instability, such as room temperature fluctuations or instrument malfunctions should be found and corrected.

For accurate sample quantitation, it is important that standards, samples, and blanks be run with the same instrument parameters; therefore, standards should be rerun each time an instrument parameter (e.g., column or detector temperature, event settings, etc.) is changed.

8.3 Sample Analysis

Sample analysis methods vary according to the sample matrix and the requirements of the projects. Detailed procedures are described in the technical instructions for each type of analysis and in the project-specific work plan.

9.0 Quality Control Checks and Acceptance Criteria

9.1 Blanks

Blanks are run as a quality control measure, in order to show that any contamination detected in a sample is truly native to the sample and has not been introduced by the operator (via a dirty syringe or contaminated solvents) or the instrument (via contaminated inlet lines).

- <u>Syringe Blanks</u> are used when air or headspace samples are being introduced into the instrument via manual injection. A known quantity of the ambient air is injected into the instrument, using the same syringe as was used for the samples. Alternatively, syringe blanks may be obtained by withdrawing air from an empty pre-cleaned VOA vial or other supply of clean air if the ambient air is suspected of contamination. Syringe blanks should be run at the beginning of each day and after every contaminated sample, in order to insure that no contaminants remain in the syringe before the next sample is run. Chromatograms for blanks should be void of any peaks. If peaks appear in the blank chromatogram, the syringe should be flushed out a few times with clean air and the blank injection repeated. If the problem is then not rectified, the syringe should be cleaned or a new syringe used. In the latter case, use of a new syringe should begin with a syringe blank.

- Air Blanks are used for ambient air monitoring and for soil gas sampling. Air blanks may consist of ambient air or hydrocarbon-free air. Air blanks should be run before each soil gas sample to ensure the sampling train and instrument are clean.

- Reagent Blanks (or solvent blanks) are used when solvent extracts are analyzed, as in the case of PCBs or other semi-volatile compounds. A reagent or solvent blank is simply an injection of "clean" solvent to ensure that contaminants are not present as impurities in the solvent being used for extractions. Obviously any contamination introduced via the syringe or any other transfer vehicle will also be detected by a solvent blank. As in the case of syringe blanks, the blank chromatogram should be free of peaks other than the solvent peak itself.

9.2 Field Duplicates

A duplicate (repeat) analysis of at least one contaminated sample (i.e., a sample that contains measurable quantities of target compounds) should be performed each day to monitor and assure the precision of the analytical method.

In addition, it is prudent to perform replicate injections of a sample containing measureable quantities over a period of time to detect degradation of samples over time. This is essential if significant time may elapse between collection and analysis of samples.

10.0 Documentation

The chromatograms for a group of samples should be labeled at the beginning of the day with the following information:

- site name
- project number
- date analyzed
- analyst name
- instrument
- column used
- carrier gas specifications
- carrier gas flowrate
- column temperature setting (if controlled)
- chart speed (cm/hr)
- chart input (V)
- program used (Photovac 10S50)
- map or sketch showing sampling points

Each individual chromatogram during the course of the day should be labeled with the following information:

- sample identification or number
- gain or attenuation
- injection volume (µL)
- time of injection
- ambient temperature during analysis
- flowmeter readings

Peaks in the sample chromatogram should be labeled if they can be tentatively identified based on comparison with a known reference standard.

Chromatograms should be pasted or taped to the Field Record Log (Figure 1) in a bound notebook. The table of contents in this notebook should consist of a sample sequence log, which lists each sample analyzed (by ID no.) and the date and time of each analysis. An additional column can be used for remarks on any notable properties of the samples (e.g., color, odor, etc).

In addition to the chromatogram notebook, a field logbook must be maintained that documents the chronology of daily events. Information that should be recorded in the logbook includes the instrument operator's name; any problems with instrumentation, with explanation of corrective actions; any changes in ambient temperature or the working environment (whether inside or outside); any circumstances of sample collection that might affect the meaning or interpretation of the data; how standards were prepared and analyzed; and any calculations of sample or standard concentrations. Each page in the logbook should be dated and signed by the person making the entry.

11.0 Troubleshooting

The reader should refer to the troubleshooting guide that may be obtained from Supelco.

Figure 1
GAS CHROMATOGRAPHY - FIELD RECORD LOG

Project No. ____________________ Page ______

SAMPLE INFORMATION

CHROMATOGRAM

Company Name ____________________

Sample No. ____________________

Date ____________________

Time ____________________

Temperature ____________________

Sample Depth (ft) ____________________

Instrumental Gain ____________________

Sample Location ____________________

____

____

Comments ____________________

____

____

____

____

Location Sketch

Signature ____________________

Figure 2

DERIVATION OF STANDARD CALCULATION

Density of TCE = 1.4642 g/mL

Molecular weight of TCE = 131 g/mol

Target concentration = 25 ppm

Tedlar bag volume = 10 L

$$25 \text{ ppm} = \frac{25\ \mu\text{L TCE}}{\text{L air}} = \frac{2.5 \times 10^{-5}\ \text{L TCE}}{\text{L air}}$$

Therefore, at 25 ppm TCE, the total volume of TCE gas in the 10 L bag will be:

$$\frac{2.5 \times 10^{-5}\ \text{L TCE}}{\text{L air}} \times \frac{10}{10} = \frac{2.5 \times 10^{-4}\ \text{L TCE}}{10\ \text{L air}}$$

Then the volume of liquid TCE that will occupy 2.4 x 10^{-4} liters as a gas must be computed using the ideal gas law, which states that in a standard atmosphere at 25°C and 1 atm, one mole of gas occupies 24.47 liters. Thus, the number of moles of TCE in 2.5 x 10^{-4} liters is:

$$2.5 \times 10^{-4}\ \text{L TCE} \times \frac{1\ \text{mole}}{24.47} = 1.02 \times 10^{-5}\ \text{moles}$$

Since the density and molecular weight of liquid TCE are known to be 1.46 g/mL and 131 g/mole, respectively, the volume of liquid TCE that must be injected into the Tedlar bag is:

$$1.02 \times 10^{-5}\ \text{moles} \times \frac{131\ \text{g/mol}}{1.46\ \text{g/mL}} = 9.1 \times 10^{-4}\ \text{mL}$$

$$= 0.91\ \mu\text{L}$$

Therefore a 0.91 µL injection of TCE in a 10 L Tedlar bag will result in a TCE concentration of 25 ppm.

ENSR

APPENDIX D

STANDARD OPERATING PROCEDURE 7600

DECONTAMINATION OF EQUIPMENT

STANDARD OPERATING PROCEDURE

Title: Decontamination

Date: 1st Qtr 19
Number: 7600
Revision: 1

1.0 General Applicability

This SOP describes the methods to be used for the decontaminization of all field equipment which becomes potentially contaminated during a sample collection task. The equipment may include split spoons, bailers, trowels, shovels, hand augers, or any other type of equipment used during field activities.

Decontamination is performed as a quality assurance measure and a safety precaution. It prevents cross-contamination between samples and also helps to maintain a clean working environment for the safety of all field personnel involved, including the environment.

Decontamination is mainly achieved by rinsing with liquids which include: soap and/or detergent solutions, tap water, deionized water, and methanol. Equipment will be allowed to air dry after being cleaned or may be wiped dry with chemical free cloths or paper towels if immediate re-use is needed.

The frequency of equipment use, dictates that most decontamination be accomplished at each sampling site between collection points. Waste products produced by the decontamination procedures such as waste liquids, solids, rags, gloves, etc. will be collected and disposed of properly based on the nature of contamination. All cleaning materials and wastes should be stored in a central location so as to maintain control over the quantity of materials used and/or produced throughout the study.

2.0 Responsibilities

It is the primary responsibility of the site operations manager to assure that the proper decontamination procedures are followed and that all waste materials produced by decontamination are properly stored and disposed of.

It is the responsibility of the project safety officer to draft and enforce safety measures which provide the best protection for all persons involved directly with sampling and/or decontamination.

It is the responsibility of any subcontractors (i.e., drilling contractors) to follow the proper, designated decontamination procedures that are stated in their contracts and outlined in the Project Health and Safety Plan.

It is the responsibility of all personnel involved with sample collection or decontamination to maintain a clean working environment and to ensure that any contaminants are not negligently introduced to the environment.

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3.0 Supporting Materials

- cleaning liquids: soap and/or detergent solutions, tap water, deionized water, methanol
- personal safety gear (defined in Project Health and Safety Plan)
- chemical-free paper towels
- disposable gloves
- waste storage containers: drums, boxes, plastic bags
- cleaning containers: plastic buckets, galvanized steel pans
- cleaning brushes

4.0 Methods or Protocol for Decontamination

4.1 General Procedures

4.1.1 The extent of known contamination will determine to what extent the equipment needs to be decontaminated. If the extent of contamination cannot be readily determined, cleaning should be done according to the assumption that the equipment is highly contaminated until enough data are available to allow assessment of the actual level of contamination.

4.1.2 Adequate supplies of all materials must be kept on hand. This includes all rinsing liquids and other materials listed in Section 3.0.

4.1.3 The standard procedures listed in the following section can be considered the procedure for full field decontamination. If different or more elaborate procedures are required for a specific project, they will be spelled out in the project work plan. Such variations in decontamination may include following all, just part, or an expanded scope of the decontamination procedure stated herein.

4.2 Standard Procedures

4.2.1 Remove any solid particles from the equipment or material by brushing and then rinsing with available tap water. This initial step is performed to remove gross contamination.

4.2.2 Wash equipment sampler with the soap or detergent solution.

4.2.3 Rinse with tap water

4.2.4 Rinse with deionized water

4.2.5 Rinse with methanol

4.2.6 Repeat entire procedure or any parts of the procedure if necessary

4.2.7 Allow the equipment or material to air dry before re-using

4.2.8 Dispose of any soiled materials in the designated disposal container

5.0 Specific Decontamination Procedures

5.1 Submersible Pump

5.1.1 Applicability

This procedure will be used to decontaminate submersible pumps between ground-water sample collection points and at the end of each day of use.

5.1.2 Materials

- plastic-nalgene upright cylinder
- 5-10 gallon plastic water storage containers
- methanol and dispenser bottle
- deionized water and dispenser bottle
- chemical free paper towels

5.1.3.1 During decontamination the submersible pump will be placed on a clean surface or held away from ground.

5.1.3.2 When removing the submersible pump from each well the power cord and discharge line will be wiped dry using chemical-free disposable towels.

5.1.3.3 Clean the upright plastic-nalgene cylinder with first a methanol and then a deionized water rinse, wiping the free liquids after each.

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5.1.3.4 Reverse pump backwashing all removable residual water present in the pump tubing. The pump should be shut off as soon as intermittent flow is observed from the reverse discharge.

5.1.3.5 Rinse the stainless steel submersible down hole pump section with a liberal application of methanol and wipe dry.

5.1.3.6 Place the submersible pump section upright in the cylinder and fill the cylinder with tap water, adding 50-100 ml of methanol for every one liter of water.

5.1.3.7 Activate the pump in the forward mode withdrawing water from the cylinder.

5.1.3.8 Continue pumping until the water in the cylinder is pumped down and air is drawn through the pump. At this time air pockets will be observed in the discharge line. Shut off the pump immediately.

5.1.3.9 Remove the pump from the cylinder and place the pump in the reverse mode allowing that all removable water be discharged on to the ground surface as discussed in Step 2

5.1.3.10 Using the water remaining in the cylinder, rinse the sealed portion of the power chord and discharge tube by pouring the water carefully over the coiled lines.

5.1.3.11 When reaching the next monitoring well place the pump in the well casing and wipe dry both the power and discharge lines with a clean paper towel as the pump is lowered.

5.1.4 Quality Assurance

To assure that decontamination is complete, field blank samples shall be collected using the cleaned submersible pump. These field blanks will be subsequently analyzed for the parameters of interest with respect to the ground water.

The procedure for collecting the field blanks will comprise using the pump to withdraw the tap water used for decontamination, from the plastic cylinder to sample containers. This field blank sample collection procedure shall only be performed after the materials to be used have been decontaminated.

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APPENDIX E

STANDARD OPERATING PROCEDURE 7510

PACKAGING AND SHIPMENT OF SAMPLES

1.0 Applicability

This Standard Operating Procedure (SOP) is concerned with procedures associated with the packaging and shipment of samples. Two general categories of samples exist: environmental samples consisting of air, water and soil; and waste samples which include non-hazardous solid wastes and hazardous wastes as defined by 40 CFR Part 261.

2.0 Responsibilities

It is the responsibility of the project manager to assure that the proper packaging and shipping techniques are utilized for each project. The site operations manager shall be responsible for the enactment and completion of the packaging and shipping requirements outlined in the project specific sampling plan. The site operations manager shall be responsible to research, identify and follow all applicable U.S. Department of Transportation (DOT) regulations regarding shipment of materials classified as waste.

3.0 General Method

The objective of sample packaging and shipping protocol is to identify standard procedures which will minimize the potential for sample spillage or leakage and maintain field sampling program compliance with U.S. EPA and U.S. DOT regulations.

The extent and nature of sample containerization will be governed by the type of sample, and the most reasonable projection of the sample's hazardous nature and constituents. The EPA regulations (40 CFR Section 261.4(d)) specify that samples of solid waste, water, soil or air, collected for the sole purpose of testing, are exempt from regulation under the Resource Conservation and Recovery Act (RCRA) when all of the following conditions are applicable:

A. Samples are being transported to a laboratory for analysis;
B. Samples are being transported to the collector from the laboratory after analysis;
C. Samples are being stored (1) by the collector prior to shipment for analyses, (2) by the analytical laboratory prior to analyses, (3) by the analytical laboratory after testing but prior to return of sample to the collector or pending the conclusion of a court case.

Qualification for categories A and B above require that sample collectors comply with U.S. DOT and U.S. Postal Service (USPS) regulations or comply with the following items if U.S. DOT and USPS regulations are found not to apply:

The following information must accompany all samples and will be entered on a sample specific basis on chain of custody records:

- sample collector's name, mailing address and telephone number,
- analytical laboratory's name, mailing address and telephone number,
- quantity of sample,
- date of shipment,
- description of sample, and

in addition, all samples must be packaged so that they do not leak, spill or vaporize.

4.0 General Methods

4.1 Place plastic bubble wrap matting over the base and bottom corners of each cooler or shipping container as needed to manifest each sample.

4.2 Obtain a chain of custody record as shown in Figure 1 and enter all the appropriate information as discussed in Section 3.0 of this SOP. Chain of custody records will include complete information for each sample. One or more chain of custody records shall be completed for each cooler or shipping container as needed to manifest each sample.

4.3 Wrap each sample bottle individually and place standing upright on the base of the appropriate cooler, taking care to leave room for some packing material and ice or equivalent. Rubber bands or tape should be used to secure wrapping, completely around each sample bottle.

4.4 Place additional bubble wrap and/or styrofoam pellet packing material throughout the voids between sample containers within each cooler.

4.5 Place ice or cold packs in heavy duty zip-lock type plastic bags, close the bags, and distribute such packages over the top of the samples.

4.6 Add additional bubble wrap/styrofoam pellets or other packing materials to fill the balance of the cooler or container.

4.7 Obtain two pieces of chain of custody tape as shown in Figure 2 and enter the custody tape numbers in the appropriate place on the chain of custody form. Sign and date the chain of custody tape.

4.8 To complete the chain of custody form enter the type of analysis required for each sample, by container, under the "ANALYSES" section. Under the specific analysis enter the quantity/volume of sample collected for each corresponding analysis.

If shipping the samples where travel by air or other public transportation is to be undertaken, sign the chain of custody record thereby relinquishing custody of the samples. Relinquishing custody should only be performed when directly transmitting custody to a receiving party or when transmitting to a shipper for subsequent receipt by the analytical laboratory. Shippers should not be asked to sign chain of custody records.

4.9 Remove the last copy from the chain of custody record and retain with other field notes. Place the original and remaining copies in a zip-lock type plastic bag and place the bag on the top of the contents within the cooler or shipping container.

4.10 Close the top or lid of the cooler or shipping container and with another person rotate/shake the container to verify that the contents are packed so that they do not move. Improve the packaging if needed and reclose.

When transporting samples by automobile to the laboratory, and where periodic changes of ice are required, the cooler should only be temporarily closed so that reopening is simple. In these cases, chain of custody will be maintained by the person transporting the sample and chain of custody tape need not be used. If the cooler is to be left unattended, then chain of custody procedures should be enacted.

4.11 Place the chain of custody tape at two different locations on the cooler or container lid and overlap with transparent packaging tape. For coolers with hinged covers, if the hinges are attached with screws, chain of custody tape should also be used on the hinge side.

4.12 Packaging tape should be placed entirely around the sample shipment containers. A minimum of one to two full wraps of packaging tape will be placed at at least two places on the cooler. Shake the cooler again to verify that the sample containers are well packed.

4.13 If shipment is required, transport the cooler to an overnight express package terminal or arrange for pickup. Obtain copies of all shipment records as provided by the shipper.

4.14 If the samples are to travel as luggage, check with regular baggage.

4.15 Upon receipt of the samples, the analytical laboratory will open the cooler or shipping container and will sign "received by laboratory" on each chain of custody form. The laboratory will verify that the chain of custody tape has not been broken previously and that the chain of custody tape number corresponds with the number on the chain of custody record. The analytical laboratory will then forward the back copy of the chain of custody record to the sample collector to indicate that sample transmittal is complete.

5.0 Documentation

As discussed in Section 4.0 the documentation for supporting the sample packaging and shipping will consist of chain of custody records and shipper's records. In addition a description of sample packaging procedures will be written in the field log book. All documentation will be retained in the project files following project completion.

CHAIN OF CUSTODY RECORD

Client/Project Name	Project Location	ANALYSES	REMARKS
Project No.	Field Logbook No.		
Sampler: (*Signature*)	Chain of Custody Tape No.		

Sample No./ Identification	Date	Time	Lab Sample Number	Type of Sample								REMARKS

Relinquished by: (*Signature*)	Date	Time	Received by: (*Signature*)	Date	Time
Relinquished by: (*Signature*)	Date	Time	Received by: (*Signature*)	Date	Time
Relinquished by: (*Signature*)	Date	Time	Received for Laboratory: (*Signature*)	Date	Time
Sample Disposal Method:			Disposed of by: (*Signature*)	Date	Time

SAMPLE COLLECTOR	ANALYTICAL LABORATORY	
ERT - A Resource Engineering Company 696 Virginia Road Concord, MA 01742 617-369-8910		ERT № 1663

1974-3-84

Figure 1

ERT

Date ______________________

Sig. ______________________

№ 30432

Figure 2

ENSR

ENSR Corporation Offices

Alaska	Anchorage
California	Los Angeles
	Orange County
	Ventura County
	San Francisco
Colorado	Fort Collins
Connecticut	Hartford
Dist. of Columbia	
Georgia	Atlanta
Illinois	Chicago
Louisiana	New Orleans
Massachusetts	Boston
Minnesota	Minneapolis
New Jersey	New Brunswick
Ohio	Canton
Pennsylvania	Philadelphia
	Pittsburgh
Texas	Dallas
	Houston
Washington	Seattle
Puerto Rico	San Juan
Ontario, Canada	Toronto

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0639-2336

AMOCO CHEMICAL COMPANY

Polystyrene Facility
Torrance, California

ENSR

Environmental Assessment Sampling and Analysis Report

ENSR Consulting and Engineering

(Formerly ERT)

July 1989

Document Number 0350-004.3

1050-00011

DRAFT

ENVIRONMENTAL ASSESSMENT

SAMPLING AND ANALYSIS REPORT

FOR

AMOCO CHEMICAL COMPANY POLYSTYRENE FACILITY

TORRANCE, CALIFORNIA

ENSR Consulting and Engineering

July, 1989

Document No. 0350-004.3

EXECUTIVE SUMMARY

This Environmental Assessment Sampling and Analysis Report was prepared by ENSR Consulting and Engineering for Amoco Chemical Company. The purpose of this investigation was to characterize the nature and extent of volatile organic compounds (VOCs) in soils in Tank Area 1 and Tank Area 2 at the Amoco polystyrene facility at 1225 West 196th Street, Torrance, California.

Between June 28 through June 30, 1989 ENSR personnel conducted a field investigation. Fourteen soil borings were drilled to 16.5 to 21.5 feet depths in the two target areas. Two samples from each boring were analyzed for VOCs using EPA Method 8240.

The test areas are underlain by very fine-textured sandy materials with varying proportions of silt and clay. Uppermost free groundwater occurs at a depth of about 70 feet below ground surface and was not encountered during this study.

Field screening of soil sample materials revealed the presence of VOC vapors in varying concentrations at all fourteen boring locations. This findings suggests that site soils may be amenable to vapor extraction remediation.

Laboratory tests of soil samples indicate detectable concentrations of styrene, ethylbenzene, toluene, trichloroethene (TCE), and/or perchloroethene (PCE) at nine boring locations.

The highest concentrations of VOCs were detected in Tank Area 1, containing up to 330,000 ppb of sytrene, 65,000 ppb of ethylbenzene, 1100 ppb of toluene, 46,000 ppb of TCE, and 2400 ppb of PCE. In general, soil contamination is localized laterally and diminishes substantially with depth. Bottom of contamination was determined to be less than 20 feet, except at Boring B-13 at Tank Area 2 and boring B-9 at Tank Area 1 where the bottom of contamination was not determined.

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APPENDICES

1. INTRODUCTION

1.1 Purpose

Site assessment activities were performed for the purpose of characterizing soil contamination revealed during a prior environmental testing program at the Amoco Chemical Company polystyrene facility in Torrance, California. Specifically, the current investigation focused on delineating the nature and extent of contamination by styrene, ethylbenzene, perchloroethene, and potentially other volatile organic compounds (VOCs) in shallow soils in two above-ground styrene storage tank areas. This information is required for planning possible soil remediation and construction improvement activities in the storage tank areas.

1.2 Scope of Work

This investigation was conducted by ENSR Consulting and Engineering in June and July of 1989. Field work included drilling and geologic logging of fourteen (14) soil test borings to approximately 20 foot depths, collection of soil samples at 5-foot depth intervals in each boring, field testing for VOC vapors in the soils, selection of samples for laboratory analysis, and documentation and shipment of samples. Laboratory activities involved chemical analysis of selected soil samples for previously identified volatile organic compounds. Office work involved analysis and interpretation of field and laboratory results with estimates of the volume and configuration of the affected soil mass and possible remedial options. All activities were performed in accordance with a project-specific sampling and analysis plan (ref. 1).

This investigation is limited to shallow soils in the immediate vicinity of above-ground storage tanks in the two onsite storage tank areas and is concerned exclusively with soil contamination by volatile organic compounds. Deep soil and groundwater conditions were not tested, and the occurrence of chemical substances other than volatile organic compounds was not addressed.

2. BACKGROUND

2.1 Site Description

Amoco Chemical Company operates a polystyrene manufacturing facility located at 1225 West 196th Street in Torrance, California. The plant location is shown on Figure 1, Site Location Map. Plant operations consist of formulating polystyrene product using styrene as a process raw material. Raw styrene is bulk-stored in two above-ground storage tank areas designated Tank Area 1 and Tank Area 2, as depicted on Figure 2, Site Plan.

2.2 Previous Investigations

Previous environmental studies (ref. 2, 3) revealed the presence of styrene, ethylbenzene, and perchloroethene (PCE) in Tank Area 1 and Tank Area 2 soils and the apparent absence of groundwater contamination. These prior studies consisted of laboratory analysis of four shallow soil samples, collected in various areas immediately surrounding the styrene storage tanks, and installation of six monitoring wells with laboratory testing of groundwater samples. Results of the soil tests indicate that several volatile organic compounds (VOCs) occur in varying concentrations in shallow soils at both tank areas, and that the highest VOC concentrations appear to occur in the shallowest samples. Previous test results are summarized by tank area below. (The units of measurement in the laboratory reports are converted from milligrams per kilogram (mg/kg) and micrograms per kilogram (μg/kg) to parts per billion (ppb)).

<u>Tank Area 1</u>	Ethylbenzene:	720,000 ppb at one foot, 140,000 ppb at 2 feet, 47,000 ppb at 5 feet
	Styrene:	100,000 ppb at one foot, 9,000 ppb at 5 feet
<u>Tank Area 2</u>	Ethylbenzene:	50,000 ppb at one foot
	PCE:	4,000 ppb at one foot

3. SUBSURFACE INVESTIGATION

3.1 Soil Boring and Sampling

During June 27-30, 1989, ENSR conducted a subsurface field investigation at the Amoco Chemical Company facility in Torrance, California. The investigation consisted of 14 soil borings, each drilled to a depth of between approximately 16.5 to 21.5 feet, with accompanied soil sampling at five-foot depth intervals. All boring locations were previously determined and cleared for underground obstructions with an Amoco representative. Boring locations are depicted on Figures 3 and 4.

All soil borings were completed using a skid-mounted hollow-stem auger specially designed for use in small or confined spaces inaccessible to standard truck-mounted equipment. A six-inch continuous flight solid-stem auger was used to complete the borings. Soil samples were collected using a standard hammer-driven 18-inch long, 2.5-inch diameter split-spoon sampler fitted with three six-inch long brass sample tubes. Upon retrieval of the sampler, representative soil materials were described for physical characteristics and observable indications of contamination. Logs of borings are presented in Appendix A. The lead sample tube from the sampler was capped on both ends with Teflon tape under plastic end caps. The sample caps were then secured with plastic tape and identified with indelible ink. Each sample was labelled with boring number, sample depth, sample analyses, and date and time collected. The samples were then placed in a pre-cooled ice chest and transported with documented chain-of-custody forms to a state-certified laboratory for chemical analysis. Chain-of-custody documentation is provided in Appendix B. Laboratory reports are presented in Appendix C.

The drilling and sampling equipment was thoroughly decontaminated between each use. The augers and drilling bit were steam cleaned with a high pressure steam cleaner, and all associated waste water was confined in a cleaning basin. The sampling equipment was decontaminated using a tap water rinse, a thorough scrubbing with tap water and trisodium phosphate detergent, a second tap water rinse, and a final rinse with distilled water.

Following the boring and sampling, the borings were backfilled with a neat concrete cement grout to ground surface. All drill cuttings were placed in sealed 55-gallon steel drums which were labelled and stored onsite in an Amoco approved secure location.

3.2 Sample Selection and Laboratory Analysis

Collected sample materials were screened in the field as a basis for selection for laboratory analysis. The screening method consisted of ambient temperature headspace analysis of soil materials by use of a portable gas chromatograph (GC) calibrated to styrene, ethylbenzene, benzene, toluene, and xylene. Two samples from each boring were selected for laboratory analysis of volatile organic compounds by EPA Test Method 8240. Samples were selected for laboratory analysis based on GC readings in an attempt to define the bottom of suspected contamination. Detailed methodology for headspace vapor measurements are presented in Appendix D. Instrument gas chromatograms are provided in Appendix E.

4. HYDROGEOLOGY

4.1 Regional

The Amoco facility is located in the Torrance Plain sub-unit of the West Coast Groundwater Basin, which is part of the Los Angeles Coastal Plain geomorphic province (ref. 4). Geologic materials underlying the facility consist of approximately 1200 feet of interbedded sands, gravels, silts, and clays of the Lakewood and San Pedro Formations, which contain the majority of useable regional groundwater resources. The Lakewood Formation occurs from ground surface to a depth of about 200 feet in the site vicinity, and is underlain by approximately 1,000 feet of the San Pedro Formation. The San Pedro Formation is, in turn, underlain by an undetermined thickness of the Pico Formation.

The principal aquifers underlying the site vicinity include the Gage Aquifer at the base of the Lakewood Formation, and the Lynwood and Silverado aquifers in the upper portions of the San Pedro Formation. From available information (ref. 4,5,6), all three aquifers are in a confined groundwater condition and have a generally eastward flow direction.

A regional shallow perched or semi-perched groundwater system occurs above the principal aquifers in an unconfined condition at depths between about 10 feet to 80 feet throughout the Torrance Plain (ref. 6). Flow direction in this system is generally eastward.

4.2 Local

Previous deep on-site drilling for purposes of groundwater monitoring indicates the upper 90 feet of geologic materials consist of varying proportions of interbedded clayey, silty, and sandy strata (ref. 2). In general, the uppermost 20 to 30 feet are predominantly silty and clayey deposits with minor sand. In most of these borings, predominantly sandy strata were noted from about 60 feet to 90 feet. The intervening strata between about 30 to 60 feet were described variably from boring to boring as containing either sandy, silty, or combinations of sandy and silty beds. Bedding appears to be lenticular and generally discontinuous and highly variable between these borings, such that correlation of stratigraphy or particular strata is not apparent. A possible exception is the occurrence of a shell bed or beds noted in three of the deep borings at 40 to 50 feet depth.

The current study included drilling of 14 shallow test borings to depths between 17.5 and 21.5 feet in exposed soils immediately surrounding the styrene tanks in the two tank areas. Observations of recovered sample materials generally confirmed the fine texture of near-surface sediments noted during the previous drilling program. While the ENSR boring logs indicate a somewhat coarser texture of these materials (i.e. more sandy, less clayey) than previously noted, the difference may be ascribed to differing field logging methods. In any case, the shallow sediments at the facility are consistently characterized as containing significant proportions of silt and clay with varying sand content.

Groundwater underlying the facility occurs in a shallow perched or semi-perched unconfined system, and in a system of deep confined aquifers. Uppermost free groundwater of the shallow unconfined system was noted during the previous drilling program to occur at depths ranging from 69 to 73 below ground surface (ref. 2), in the upper portion of the Lakewood Formation. Water levels in the deep regional aquifers underlying the facility are at a depth of about 100 feet (ref. 5) which reflect the potentiometric surface of confined groundwaters in the Gage Aquifer at the base of the Lakewood Formation, and in the Lynwood and Silverado Aquifers in the underlying San Pedro Formation.

5. ANALYTICAL RESULTS

5.1 Field Screening

Samples were collected at 5-foot depth intervals in all test borings. Representative soil materials from each sampling interval were field tested for organic vapor content as a means of assessing potential contamination and selecting samples for laboratory analysis. Organic vapors were analyzed for the specific chemical species styrene, benzene, toluene, xylenes, and ethylbenzene with a portable gas chromatograph calibrated to these compounds. The methodology used is described in Appendix D. Instrument chromatographs for all vapor analyses are presented in Appendix E. Field soil vapor analyses are summarized on Table 1, Soil Vapor Readings.

The most commonly detected vapors in the tested soil samples were styrene and ethylbenzene, which were detected in varying concentrations in most sample materials. This finding correlated generally with the results of laboratory analyses of soil samples, in that these compounds were also the most commonly detected in the laboratory samples. However, a direct correlation between field vapor and laboratory analyses is not apparent. For example, the highest field vapor readings do not correspond directly with the highest laboratory results for particular samples. In many cases, laboratory results for a given compound or compounds were negative, although the field vapor analysis suggested the presence of the compound(s). This discrepancy is attributed to the occurrence of the compound(s) entirely in the vapor phase, which the laboratory method cannot detect. The laboratory method is more sensitive to compounds existing in a free liquid state or adhered to soil particles.

5.2 Laboratory

Two soil samples from each boring were analyzed for volatile organic compounds (VOCs) by EPA Test Method 8240. This method of analysis uses mass spectrometry to identify and quantify volatile organic compounds. The detection limits for these compounds will vary for each sample run. The reason for this is that samples exhibiting evidence of visual/olfactory contamination are diluted, prior to analysis, in order to reduce the possibility of contaminating the analytical instrument. The samples, when necessary, are diluted by a factor of ten, thus increasing the detection limit by a factor of ten. The detection limits for these samples range from 50 parts per billion (ppb) to 5000 ppb.

Only eight samples of the 28 analyzed showed any detectable concentrations of VOCs as indicated on Table 2, Laboratory Results. (To simplify presentation of the data, the units of measurement in the laboratory reports are converted from micrograms per kilogram ($\mu g/kg$) to parts per billion (ppb)). Chemical species detected were toluene, ethylbenzene, styrene, perchloroethene (PCE), and trichloroethene (TCE). The highest levels were encountered in boring B-13. Sample B-13-15 contained detectable amounts of the following: toluene (1,100 ppb), ethylbenzene (65,000 ppb), styrene (330,000 ppb), PCE (2,400 ppb), and TCE (46,000 ppb). Sample B-13-20 also showed significant levels of VOCs: ethylbenzene (20,000 ppb), styrene (100,000 ppb), PCE (1,400 ppb), TCE (6,800 ppb). Sample B-14-20 also had detectable levels of VOCs, but in lesser concentrations: ethylbenzene (130 ppb), styrene (190 ppb), PCE (75 ppb), and TCE (290 ppb). Only 100 ppb of TCE was detected in sample B-1-10. The only detectable compounds in samples B-5-10 and B-11-10 were PCE and TCE in the following amounts: B-5-10 contained 8000 ppb of PCE and 44,000 ppb of TCE, and sample B-11-10 contained 80 ppb of PCE and 90 ppb of TCE. The final samples from boring B-9 are from 15 and 20 feet. These samples contained detectable concentrations of ethylbenzene and styrene. Sample B-9-15 contained 700 ppb of ethylbenzene and 1200 ppb of styrene, while sample B-9-20 contained 950 ppb of ethylbenzene and 4400 ppb of styrene.

6. DISCUSSION

6.1 General

A principal finding of ENSR's current investigation is that the highest levels of VOCs occur in Tank Area 1 soils, most notably near tanks T-2, T-3, and T-4. This finding agrees with previous shallow soil testing results. VOC contamination was found to diminish substantially with depth in Tank Area 1 borings, and appears to occur in very localized areas. However, significant concentrations of styrene, ethylbenzene, and chlorinated solvents were detected in the 20-foot sample from boring B-13, indicating that the total depth of contamination at that location is not known. An additional concern at Tank Area 1 is the occurrence of chlorinated solvents in high concentrations at 10 feet depth at boring B-5 and in substantially less concentrations at 15 feet depth at boring B-14. While the presence of solvents at these locations is significant, the base of contamination is delineated.

Conditions at Tank Area 2 are of lesser apparent concern due to lower levels of styrene, ethylbenzene, and solvents, the non-detection of toluene, apparent isolation of contaminants in small areas, and generally shallower extent of contamination. Solvents were noted in two small areas near borings B-1 and B-11 and appear to be confined to less than 15 feet depth. An anomalous condition is apparent at boring B-9 where styrene and ethylbenzene occur in minor concentrations, increasing nominally with depth, to the total depth of the boring at 20 feet. The total depth of contamination at this location has therefore not been determined.

6.2 Solvents

The occurrence of chlorinated solvents has been confirmed from prior studies which noted PCE in shallow soil at Tank Area 2. In addition, the ENSR investigation has revealed PCE and TCE in significant concentrations at two locations of Tank Area 1. These are confined to less than 20 feet depth at boring B-5, but are present also at 20 feet at boring B-13 where the total depth of contamination has not been determined. Solvents are associated with high styrene and ethylbenzene concentrations, and with the only toluene detected in the current study, at boring B-13. However, solvents occur independently of other contaminants at boring B-5. Therefore, solvents occur as a separate entity and apparently not in association with other materials, such as styrene or ethylbenzene.

6.3 Vapors

Styrene and ethylbenzene vapors occur in most field tested samples. Benzene and toluene were noted less commonly. Xylene vapors were not detected in any samples. In addition, one to four unidentified vapors were noted in all tested samples. The unidentified vapors may be related to chlorinated solvents but this is not confirmed by laboratory testing, due either to the absence of these materials or their occurrence below the laboratory detection limit.

The source of soil vapors may be the result of fugitive emissions from the storage system in the vapor state, or liquid spillage. Vapors entering the soil from either source would infiltrate and migrate through preferentially permeable strata. A one-foot thick zone of plastic-like material was observed at the ground surface at boring B-11. It is presumed this has occurred as a result of spilled liquid self-polymerizing in the soil.

While chemically-identified vapors occurred in most samples, corresponding chemical species were not detected in all laboratory tested samples. The presumption in cases where the materials were not detected at the laboratory is that either the substances occurred only in the vapor phase, which would be lost during laboratory sample preparation, or occur at concentrations below the laboratory detection limit.

The presence of soil vapors (chemically-identified or unknowns), in all areas and depths tested indicates that site soils are permeable to vapor migration and are potentially suitable for remediation by vapor extraction techniques.

7.0 CONCLUSIONS

ENSR Consulting and Engineering performed this environmental assessment at the Amoco Chemical Company Polystyrene Facility in Torrance, California in order to define the lateral and vertical extent of VOC contamination of soils in Tank Areas 1 and 2. Based upon field and laboratory data generated during our subsurface investigation, we have concluded the following.

- The soil borings indicate that the top 20 feet of the soil column are comprised of fine grained sediments, with varying proportions of sands, silts, and clays.
- Field gas chromatography revealed that styrene, ethylbenzene, and several unidentified VOCs were present in the vapor phase in varying concentrations in all 14 borings at 5, 10, 15, and 20 feet below grade.
- Laboratory analysis of 28 selected soil samples indicated detectable VOC concentrations in only eight samples from six borings. VOCs found included styrene, ethylbenzene, toluene, perchloroethene (PCE), and trichloroethene (TCE). With one exception, concentrations decreased with depth.
- Comparison of the soil vapor and laboratory data indicates that VOCs are present in the vapor phase throughout the soils beneath Tank Areas 1 and 2, but that measurable soil contamination is limited to a few specific areas. The vertical extent of contamination was determined in all cases except at borings B-9 (Tank Area 2) and B-13 (Tank Area 1).
- The presence of soil vapors throughout the tank areas indicates that the soils are permeable to vapor migration and, therefore, possibly amenable to remediation through vapor extraction. However, the fine grained texture of the soils necessitates field testing to determine its suitability.

8. STUDY LIMITATIONS

This report, including the appendices attached thereto, describes the results of ENSR's soil sampling and analytical investigation to identify the potential presence of a contamination problem involving or affecting the subject property. The conclusions and recommendations stated herein represent the application of a variety of engineering and technical disciplines to material facts and conditions associated with the subject property, and possible remedial measures. Many of these facts and conclusions are subject to change over time; accordingly, the conclusions and recommendations must be viewed with this context.

ENSR has performed this investigation in a professional manner using that degree of skill and care exercised for similar projects under similar conditions by reputable and competent environmental consultants. ENSR shall not be responsible for conditions or consequences arising from relevant facts that were concealed, withheld, or not fully disclosed at the time the evaluation was performed.

9.0 REFERENCES

1. ENSR Consulting and Engineering, Amoco Chemical Company Polystyrene Facility Environmental Assessment Sampling and Analysis Plan; June, 1989.

2. HydroSolutions of California, Field Drilling Report Amoco Chemical Company Plant, Torrance, California; July 22, 1988.

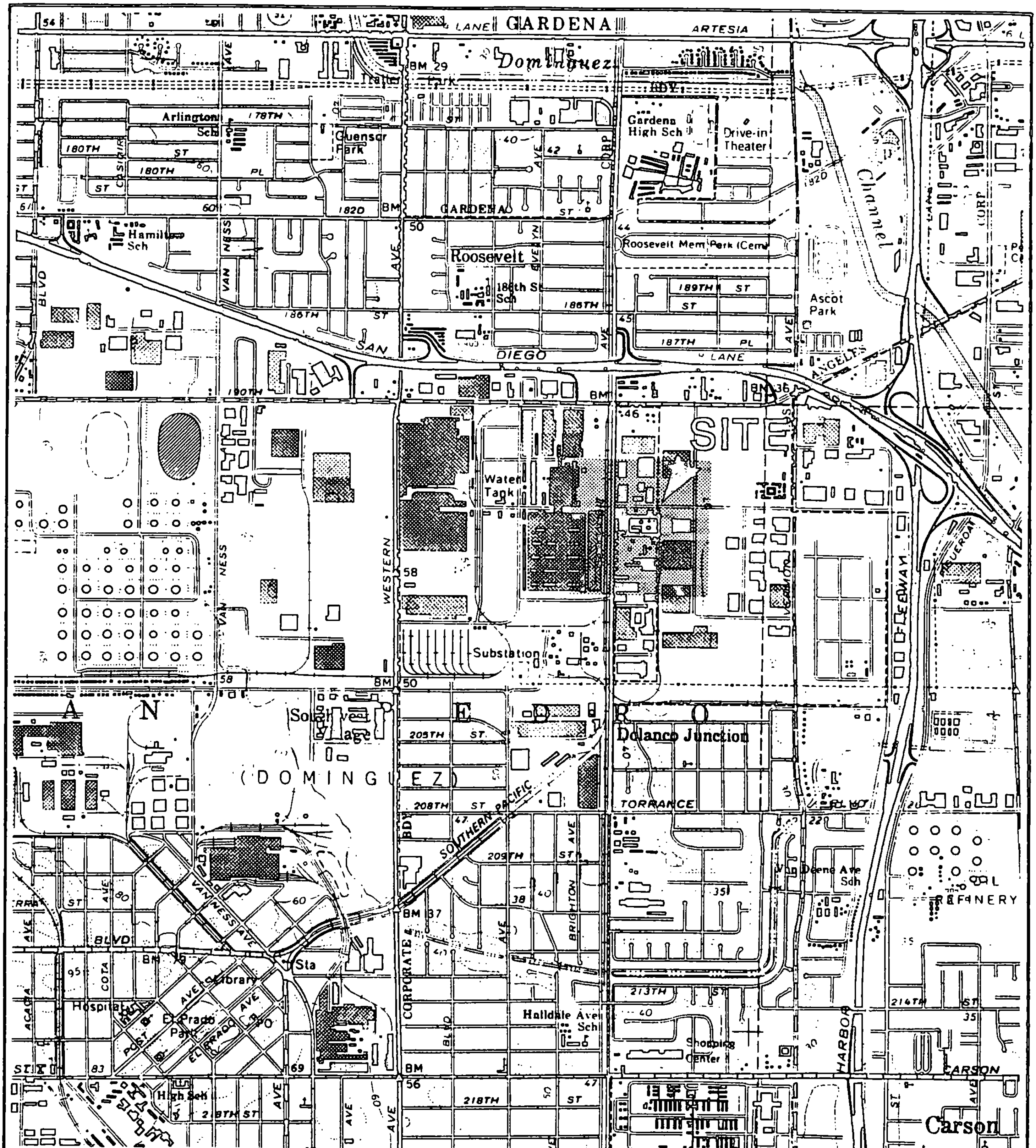
3. Unnamed Technical Report (source: Amoco Chemical); 1988.

4. California Department of Water Resources, Bulletin 104 Planned Utilization of the Groundwater Basins of the Coastal Plain of Los Angeles County; June, 1961.

5. Los Angeles County Department of Public Works; Coastal Plain Deep Aquifer Groundwater Contour Map, Fall, 1987.

6. Los Angeles County Flood Control District; Coastal Plain Shallow Aquifer Map, Fall, 1978

FIGURES



REFERENCE: USGS 7.5 MINUTE SERIES
TORRANCE QUADRANGLE 1981

N

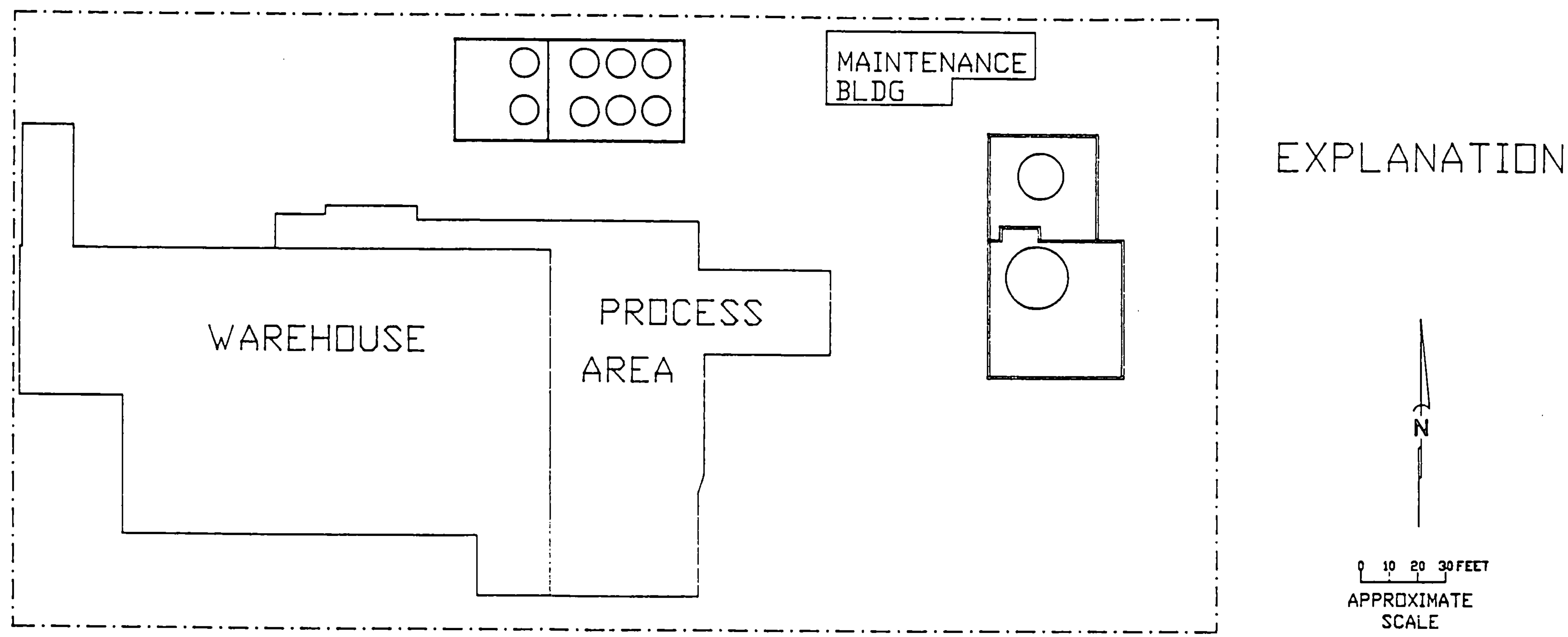
0 ¼ ½ 1 MILE

SCALE

ENSR

SITE LOCATION MAP
AMOCO CHEMICALS CORPORATION
1225 WEST 196th STREET
TORRANCE, CALIFORNIA

DRAWN BY: BM	DATE: 6/7/89	PROJECT NO.: 0350-004
CHK'D BY:	REVISED:	DWG.NO.: FIGURE 1



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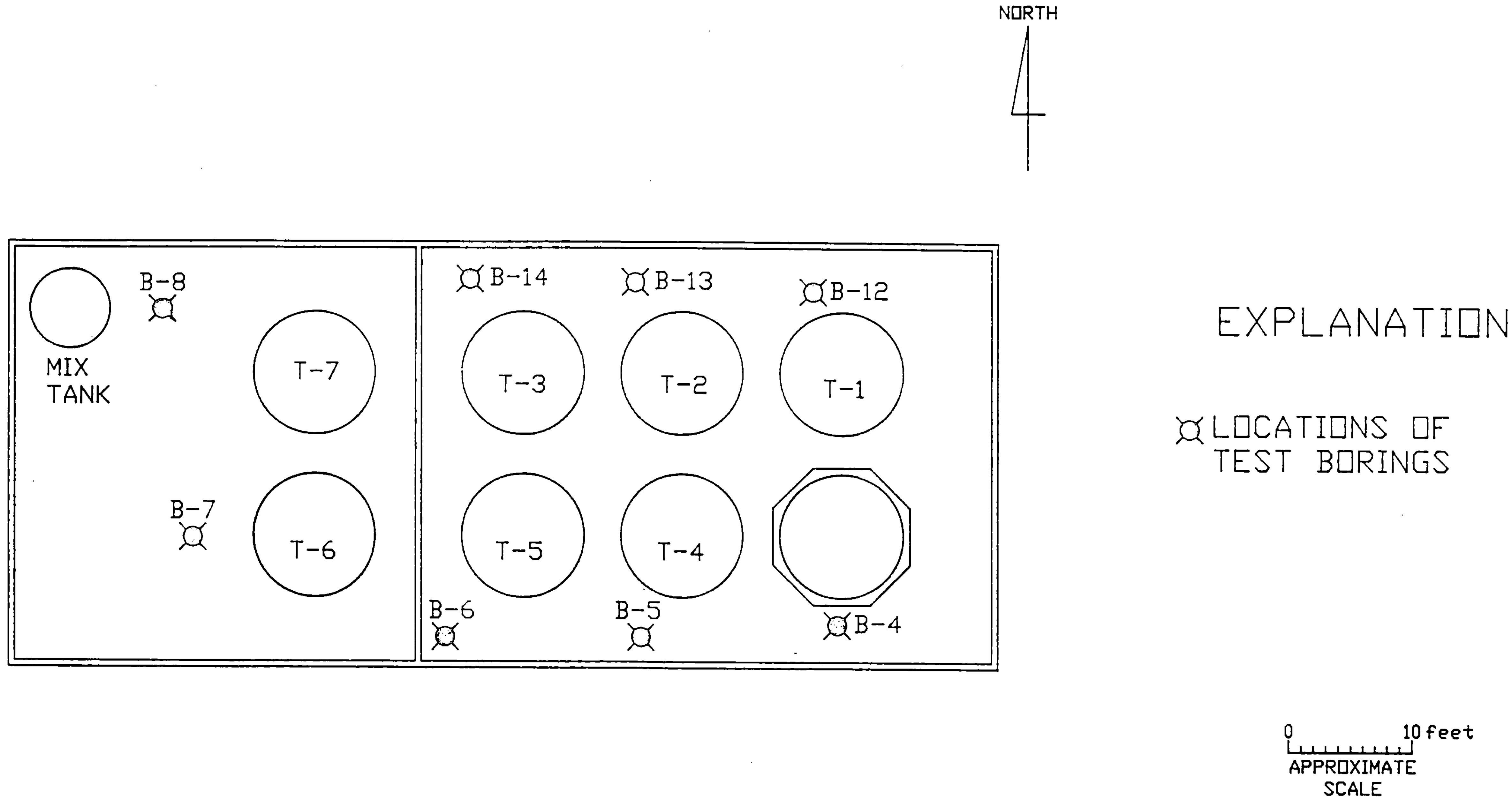
SITE PLAN
AMOCO CHEMICALS CORPORATION
1225 WEST 196th STREET
TORRANCE, CALIFORNIA

by:C.Keller PROJECT 0350-004 FIGURE 2



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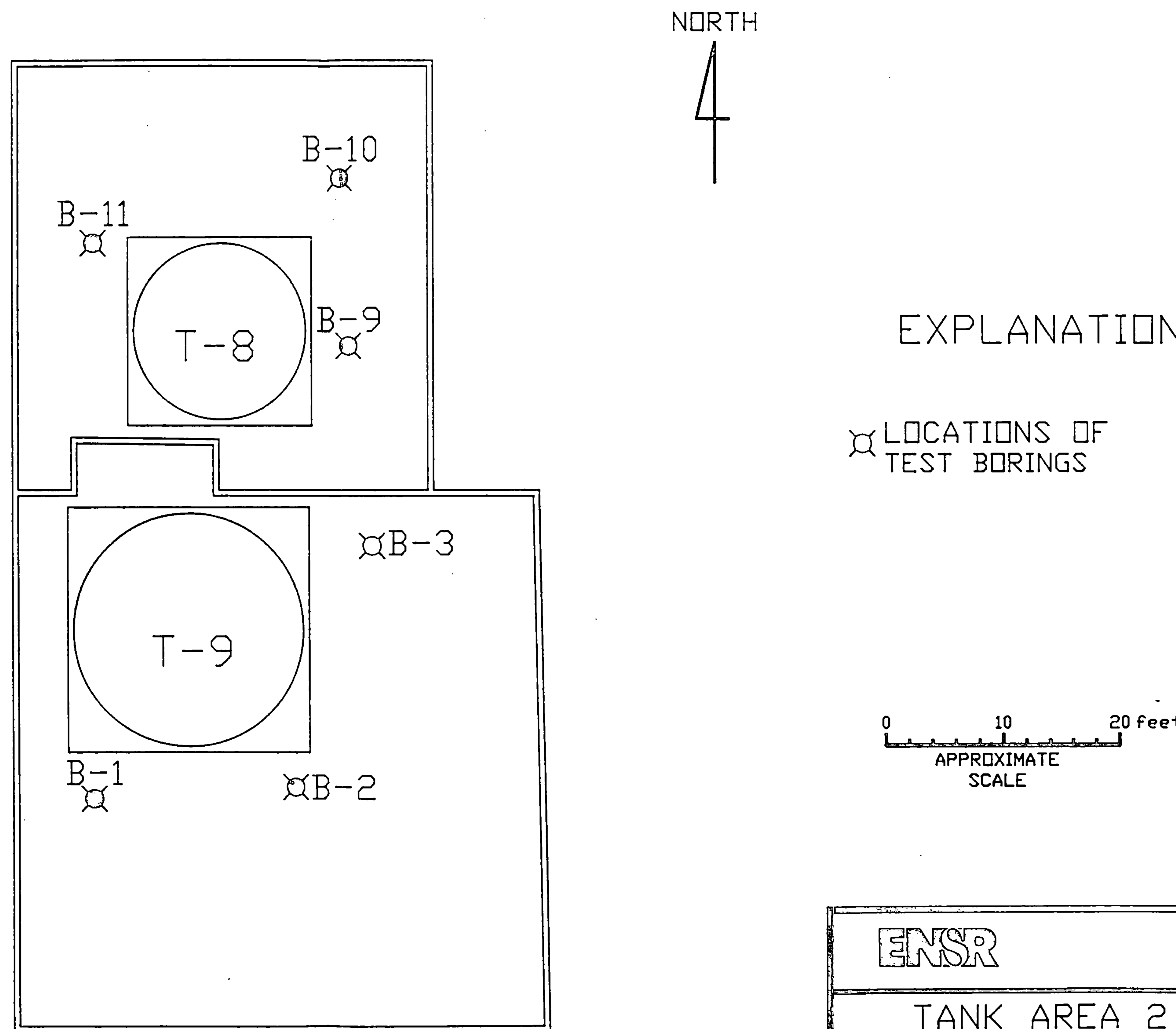
TANK AREA 1

TEST BORING LOCATIONS
AMOCO CHEMICAL COMPANY
1225 WEST 196th STREET
TORRANCE, CALIFORNIA

by:C.Keller PROJECT 0350-004 FIGURE 3



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TANK AREA 2
TEST BORING LOCATIONS
AMOCO CHEMICAL COMPANY
1225 WEST 196th STREET
TORRANCE, CALIFORNIA
by:C.Keller PROJECT 0350-004 FIGURE 4

	5 FT.
S	9000
EB	47000
T	<1000
TCE	<1000
PCE	<1000

	15 FT.	20 FT.
S	190	<100
EB	130	<50
T	<50	<50
TCE	290	<50
PCE	75	<50

	15 FT.	20 FT.
S	330K	100K
EB	65000	20000
T	1100	<1000
TCE	46000	6800
PCE	2400	1400

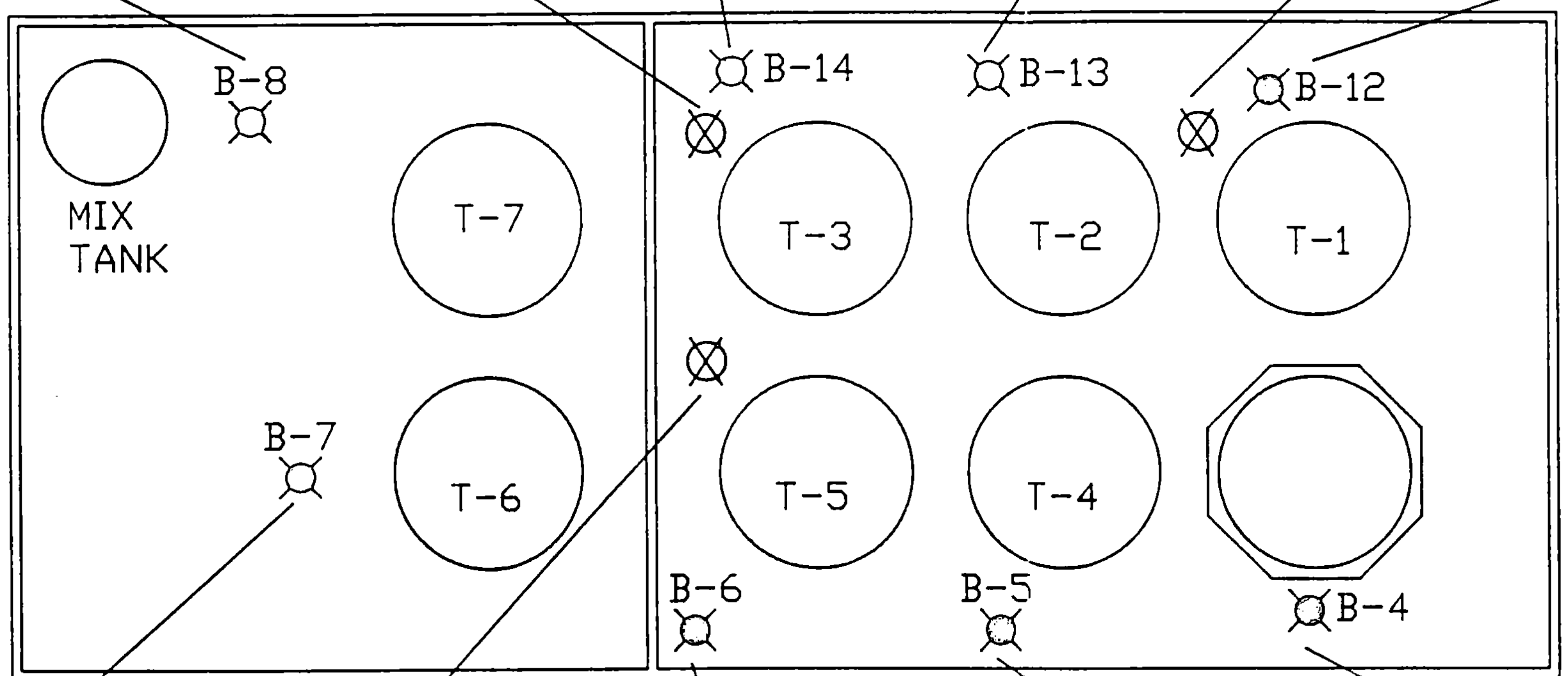
	2 FT.
S	<2000
EB	140000
T	<2000
TCE	<2000
PCE	<2000

ALL NON-DETECTED AT 15 AND 20 FT.

ALL NON-DETECTED AT 15 AND 20 FT.

NORTH

0 10 feet
APPROXIMATE SCALE



ALL NON-DETECTED AT 10 AND 15 FT.

	1 FT.
S	100000
EB	720000
T	<10000
TCE	<10000
PCE	<10000

ALL NON-DETECTED AT 15 AND 20 FT.

	10 FT.	20 FT.
S	<1000	<100
EB	<500	<50
T	<500	<50
TCE	44000	<50
PCE	8000	<50

ALL NON-DETECTED AT 10 AND 20 FT.

EXPLANATION

LOCATIONS OF TEST BORINGS

S = STYRENE
EB = ETHYLBENZENE
T = TOLUENE
TCE = TRICHLOROETHENE
PCE = PERCHLOROETHENE

< NOT DETECTED AT STATED DETECTION LIMIT

CONCENTRATIONS IN ug/kg (ppb)

PRIOR TEST AREA

ENSR

TANK AREA 1

VOC CONCENTRATIONS IN SOIL
AMOCO CHEMICAL COMPANY
1225 WEST 196th STREET
TORRANCE, CALIFORNIA

by C.Keller PROJECT 0350-004 FIGURE 5

B-11, 1 FT.:

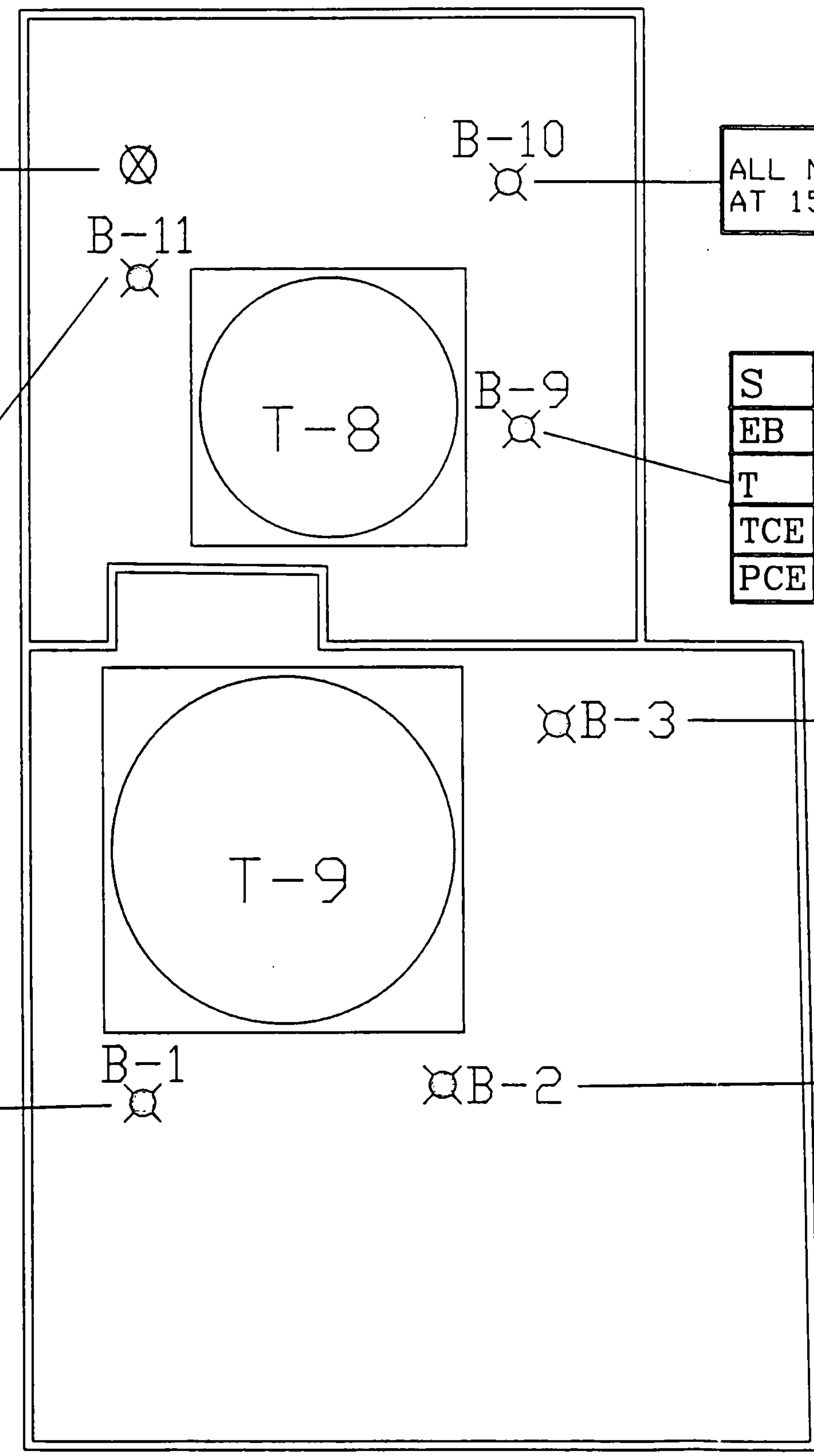
	1 FT.
S	<1000
EB	50000
T	<1000
TCE	<1000
PCE	4000

B-11:

	10 FT.	15 FT.
S	<100	<100
EB	<50	<50
T	<50	<50
TCE	90	<50
PCE	80	<50

B-1:

	10 FT.	15 FT.
S	<100	<100
EB	<50	<50
T	<50	<50
TCE	100	<50
PCE	<50	<50



B-10: ALL NON-DETECTED AT 15 AND 20 FT.

B-9:

	15 FT.	20 FT.
S	1200	4400
EB	700	950
T	<50	<50
TCE	<50	<50
PCE	<50	<50

B-3: ALL NON-DETECTED AT 10 AND 20 FT.

B-2: ALL NON-DETECTED AT 10 AND 20 FT.

NORTH

0 10 20 feet
APPROXIMATE SCALE

EXPLANATION

LOCATIONS OF TEST BORINGS

S = STYRENE
EB = ETHYLBENZENE
T = TOLUENE
TCE = TRICHLOROETHENE
PCE = PERCHLOROETHENE

< NOT DETECTED AT STATED DETECTION LIMITS

CONCENTRATIONS IN ug/kg (ppb)

PRIOR TEST AREA

ENSR

TANK AREA 2

VOC CONCENTRATIONS IN SOIL
AMOCO CHEMICAL COMPANY
1225 WEST 196th STREET
TORRANCE, CALIFORNIA

by:C.Keller PROJECT 0350-004 FIGURE 6

TABLES

TABLE 1 SOIL VAPOR READINGS (in ppm)

SAMPLE #	STYRENE	B	T	X	E	# OF UNKNOWNS
B-1-5	ND	ND	ND	ND	ND	3
- 10	ND	ND	ND	ND	ND	3
- 15	ND	ND	ND	ND	ND	1
- 20	NA	NA	NA	NA	NA	NA
B-2-5	ND	ND	ND	ND	4.335	3
- 10	ND	ND	ND	ND	ND	2
- 15	ND	ND	ND	ND	ND	3
- 20	ND	ND	ND	ND	ND	3
B-3-5	NA	NA	NA	NA	NA	NA
- 10	6.761	ND	ND	ND	ND	3
- 15	2.856	ND	ND	ND	ND	ND
- 20	3.018	ND	ND	ND	ND	2
B-4-5	152.4	ND	ND	ND	459.0	1
- 10	3.084	ND	ND	ND	1.255	2
- 15	1.435	ND	ND	ND	.4025	1
- 20	325.9	ND	ND	ND	231.8	2
B-5-5	ND	ND	ND	ND	70.40	2
- 10	ND	ND	ND	ND	16.77	3
- 15	ND	ND	ND	ND	ND	1
- 20	1.909	ND	ND	ND	ND	2
B-6-5	239.8	1.297	ND	ND	321.1	2
- 10	3.354	ND	ND	ND	1.664	3
- 15	106.2	ND	ND	ND	206.5	2
- 20	4.494	ND	ND	ND	ND	2

Vapors From prod units ?

TABLE 1 SOIL VAPOR READINGS (in ppm) (CONTINUED)

SAMPLE #	STYRENE	B	T	X	E	# OF UNKNOWNS
B-7-5	65.94	ND	ND	ND	5.301	1
- 10	39.95	ND	ND	ND	4.628	2
- 15	27.85	ND	ND	ND	2.404	1
- 20	21.81	ND	ND	ND	1.938	1
B-8-5	268.1	1.455	.8947	ND	10.50	ND
- 10	225.8	ND	ND	ND	ND	2
- 15	36.57	ND	ND	ND	ND	2
- 20	20.44	ND	ND	ND	ND	3
B-9-5	ND	3.192	ND	ND	8.635	1
- 10	ND	3.262	ND	ND	13.77	1
- 15	130.8	ND	ND	ND	34.41	2
- 20	4.674	ND	ND	ND	.3938	3
B-10-5	1.947	ND	ND	ND	1.575	1
- 10	3.715	ND	ND	ND	6.397	3
- 15	2.943	ND	ND	ND	ND	2
- 20	1.441	ND	ND	ND	ND	3
B-11-5	61.64	ND	ND	ND	49.78	3
- 10	80.85	ND	ND	ND	76.33	3
- 15	11.81	ND	ND	ND	9.951	3
- 20	NA	NA	NA	NA	NA	NA

vapors from prod units ?

vapors from RR loading Racks

TABLE 1 SOIL VAPOR READINGS (in ppm) (CONTINUED)

SAMPLE #	STYRENE	B	T	X	E	# OF UNKNOWNS
B-12-5	13.52	ND	ND	ND	323.8	1
- 10	3.035	ND	ND	ND	8.125	3
- 15	17.26	ND	ND	ND	40.33	2
- 20	51.74	ND	ND	ND	49.05	3
B-13-5	42.01	2.739	ND	ND	189.5	2
- 10	349.2	1.200	9.242	ND	330.6	3
- 15	189.5	ND	ND	ND	25.05	4
- 20	16.57	ND	ND	ND	1.188	3
B-14-5	40.79	5.404	ND	ND	321.4	4
- 10	57.17	ND	1.796	ND	294.9	4
- 15	282.5	2.176	1.374	ND	342.7	4
- 20	4.811	ND	ND	ND	ND	3

ND = NON DETECTED
NA = NOT ANALYZED
B = BENZENE
T = TOLUENE
X = META-XYLENE
E = ETHYLBENZENE
UNKNOWNS = UNIDENTIFIED HYDROCARBON VAPORS

TABLE 2 LABORATORY RESULTS

(ppb)

SAMPLE #	toluene	ethylbenzene	styrene	PCE	TCE
B-1-10	ND	ND	ND	ND	100
B-1-15	ND	ND	ND	ND	ND
B-2-10	ND	ND	ND	ND	ND
B-2-15	ND	ND	ND	ND	ND
B-3-10	ND	ND	ND	ND	ND
B-3-15	ND	ND	ND	ND	ND
B-4-10	ND	ND	ND	ND	ND
B-4-20	ND	ND	ND	ND	ND
B-5-10	ND	ND	ND	8000	44000
B-5-20	ND	ND	ND	ND	ND
B-6-15	ND	ND	ND	ND	ND
B-6-20	ND	ND	ND	ND	ND
B-7-10	ND	ND	ND	ND	ND
B-7-15	ND	ND	ND	ND	ND
METHOD BLANK	ND	ND	ND	ND	ND
B-8-15	ND	ND	ND	ND	ND
B-8-20	ND	ND	ND	ND	ND
B-9-15	ND	700	1200	ND	ND
B-9-20	ND	950	4400	ND	ND
B-10-15	ND	ND	ND	ND	ND
B-10-20	ND	ND	ND	ND	ND
B-11-10	ND	ND	ND	80	90
B-11-15	ND	ND	ND	ND	ND
METHOD BLANK	ND	ND	ND	ND	ND
B-12-15	ND	ND	ND	ND	ND
B-12-20	ND	ND	ND	ND	ND
B-13-15	1100	65000	330000	2400	46000
B-13-20	ND	20000	100000	1400	6800
B-14-15	ND	130	190	75	290
B-14-20	ND	ND	ND	ND	ND

next door

next door

ND= not detected. Method detection limits are indicated on laboratory reports, Appendix C.

APPENDIX A

BORING LOGS

ENSR

ENSR CONSULTING & ENGINEERING

SUBSURFACE EXPLORATION

LITHOLOGIC LOG OF B-1

Client : AMOCO CHEMICAL CORPORATION
Project Name : AMOCO CHEMICAL
Project Location : TORRANCE, CA
Job Number : 0350-004-100 Boring No : B-1
Logged By : J. NORDENSTAM
Approved By : K. PITCHFORD, C.E.G.
Drilled By : DATUM EXPLORATION

DRILLING AND SAMPLING INFORMATION
Date Started : 6/27/89 Date Completed : 6/27/89
Method : HSA/CFA Total Depth : 21.5 FEET

WELL COMPLETION INFORMATION
Screen Dia : . Length : .
Slot Size : . Type : .
Casing Dia : . Length : .

DEPTH IN FEET	DESCRIPTION SURFACE ELEVATION : 945 FEET, USGS TORRANCE, CA	SAMPLE NO.	SAMPLE TYPE	RECOVERY (FEET)	BLOW COUNT	TIME	PID *	GRAPHIC LOG	WELL COMPLETION	WATER LEVEL
	Silty SAND (SM), black to brown, clayey, damp, very stiff, no odor									
5		5	SS	1.5	48	1006				
	continued SM, becomes tan									
10	Clayey SAND (SC) stiff, damp, tan, no odor	10	SS	1.5	29	1120				
	SILT (ML) light brown, damp, medium dense, no odor									
15		15	SS	1.5	18	1215				
20	continued SILT (ML) with minor gravel and clay	20	SS	1.5	22	1238				
	Bottom of boring at 21.5 feet. No free groundwater encountered. Boring backfilled with neat concrete cement to ground surface.									
25										
30										
35										
40										
45										
50										
55	* PID: PHOTO-IONIZATION DETECTOR VALUE (eV)									

SAMPLER TYPE
SS - DRIVEN SPLIT SPOON
ST - PRESSED SHELBY TUBE
RC - ROCK CORE
CT - CONTINUOUS TUBE

BORING METHOD
HSA - HOLLOW STEM AUGER
CFA - CONTINUOUS FLIGHT AUGERS
DC - DRIVING CASING
MD - MUD DRILLING

ENSR

ENSR CONSULTING & ENGINEERING

SUBSURFACE EXPLORATION

LITHOLOGIC LOG OF B-2

Client : AMOCO CHEMICAL CORPORATION
Project Name : AMOCO CHEMICAL
Project Location : TORRANCE
Job Number : 0350-004-100 Boring No : B-2
Logged By : J. NORDENSTAM
Approved By : K. PITCHFORD, C. E. G.
Drilled By : DATUM EXPLORATION

DRILLING AND SAMPLING INFORMATION
Date Started : 6/27/89 Date Completed : 6/27/89
Method : HSA/CFA Total Depth : 21.5 FEET

WELL COMPLETION INFORMATION
Screen Dia : . Length : .
Slot Size : . Type : .
Casing Dia : . Length : .

DEPTH IN FEET	DESCRIPTION — SURFACE ELEVATION : 45 FEET USGS TORRANCE, CA	SAMPLE NO.	SAMPLE TYPE	RECOVERY (FEET)	BLOW COUNT	TIME	PID *	GRAPHIC LOG	WELL COMPLETION	WATER LEVEL
0	Silty CLAY (CL), medium stiff, damp, black, moderate odor.									
5		5	SS	1.0	41	1345				
6	Silty SAND (SM), medium dense, dry, tan clayey, fine grained sand, silt, no odor.									
10		10	SS	1.0	20	1355				
11.5	SILT (ML), stiff, damp, brown, no odor									
15		15	SS	1.0	18	1410				
20	continued SILT (ML)									
20.5	CLAY (CL), stiff, dry, tan, concretions.	20	SS	1.0	20	1430				
21.5	Total depth = 21.5 feet. No free groundwater encountered. Boring backfilled with neat concrete cement to ground surface									

* PID: PHOTO-IONIZATION DETECTOR VALUE (eV)

SAMPLER TYPE
SS – DRIVEN SPLIT SPOON
ST – PRESSED SHELBY TUBE
RC – ROCK CORE
CT – CONTINUOUS TUBE

BORING METHOD
HSA – HOLLOW STEM AUGER
CFA – CONTINUOUS FLIGHT AUGERS
DC – DRIVING CASING
MD – MUD DRILLING

ENSR

ENSR CONSULTING & ENGINEERING

SUBSURFACE EXPLORATION

LITHOLOGIC LOG OF B-3

Client : AMOCO CHEMICAL CORPORATION
Project Name : AMOCO CHEMICAL
Project Location : TORRANCE
Job Number : 0350-004-100 Boring No : B-3
Logged By : J. NORDENSTAM
Approved By : K. PITCHFORD, C. E. G.
Drilled By : DATUM EXPLORATION

DRILLING AND SAMPLING INFORMATION
Date Started : 6/27/89 Date Completed : 6/27/89
Method : HSA/CFA Total Depth : 21.5

WELL COMPLETION INFORMATION
Screen Dia : . Length : .
Slot Size : . Type : .
Casing Dia : . Length : .

DEPTH IN FEET	DESCRIPTION SURFACE ELEVATION : 45 FEET, USGS TORRANCE, CA	SAMPLE NO.	SAMPLE TYPE	RECOVERY (FEET)	BLOW COUNT	TIME	PID *	GRAPHIC LOG	WELL COMPLETION	WATER LEVEL
0	SILT (ML) black to brown-green, damp, stiff, strong odor									
5		5	SS	1.0	25	1515				
9	Clayey SAND (SC) tan, dry, medium stiff, no odor									
10		10	SS	1.0	35	1535				
14	SILT (ML) brown, damp, soft, no odor									
15		15	SS	1.0	19	1550				
20		20	SS	1.0	20	1615				
21.5	Bottom of boring at 21.5 feet. No free groundwater encountered Boring backfilled with neat concrete cement to ground surface									

Depth scale: 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55

* PID: PHOTO-IONIZATION DETECTOR VALUE (eV)

SAMPLER TYPE
SS – DRIVEN SPLIT SPOON
ST – PRESSED SHELBY TUBE
RC – ROCK CORE
CT – CONTINUOUS TUBE

BORING METHOD
HSA – HOLLOW STEM AUGER
CFA – CONTINUOUS FLIGHT AUGERS
DC – DRIVING CASING
MD – MUD DRILLING

ENSR CONSULTING & ENGINEERING

SUBSURFACE EXPLORATION

LITHOLOGIC LOG OF B-4

Client : AMOCO CHEMICAL CORPORATION
Project Name : AMOCO CHEMICAL
Project Location : TORRANCE
Job Number : 0350-004-100 Boring No : B-4
Logged By : J. NORDENSTAM
Approved By : K. PITCHFORD, C. E. G.
Drilled By : DATUM EXPLORATION

DRILLING AND SAMPLING INFORMATION
Date Started : 6/28/89 Date Completed : 6/28/89
Method : CFA Total Depth : 21.5

WELL COMPLETION INFORMATION
Screen Dia : . Length : .
Slot Size : . Type : .
Casing Dia : . Length : .

SURFACE ELEVATION : 45 FEET, USGS TORRANCE, CA

DEPTH IN FEET	DESCRIPTION	SAMPLE NO.	SAMPLE TYPE	RECOVERY (FEET)	BLOW COUNT	TIME	PID *	GRAPHIC LOG	WELL COMPLETION	WATER LEVEL
0	Clayey SAND (SC), black, damp, soft, strong odor medium grained sand, silty.									
5	continued SC brown, slight odor	5	SS	1.0	36	0831				
10		10	SS	1.5	34	0855				
13.5	Silty SAND (SM) soft, damp, brown, no odor									
15		15	SS	1.5	19	0920				
20.5	CLAY (CL) stiff, damp, light brown	20	SS	1.5	27	0952				
21.5	Bottom of boring at 21.5 feet. No free groundwater encountered Boring backfilled with neat concrete cement to ground surface.									

* PID: PHOTO-IONIZATION DETECTOR VALUE (eV)

SAMPLER TYPE
SS - DRIVEN SPLIT SPOON
ST - PRESSED SHELBY TUBE
RC - ROCK CORE
CT - CONTINUOUS TUBE

BORING METHOD
HSA - HOLLOW STEM AUGER
CFA - CONTINUOUS FLIGHT AUGERS
DC - DRIVING CASING
MD - MUD DRILLING

ENSR

ENSR CONSULTING & ENGINEERING

SUBSURFACE EXPLORATION

LITHOLOGIC LOG OF B-5

Client : AMOCO CHEMICAL CORPORATION
Project Name : AMOCO CHEMICAL
Project Location : TORRANCE
Job Number : 0350-004-100 Boring No : B-5
Logged By : J. NORDENSTAM
Approved By : K. PITCHFORD, C. E. G.
Drilled By : DATUM EXPLORATION

DRILLING AND SAMPLING INFORMATION
Date Started : 6/28/89 Date Completed : 6/28/89
Method : CFA Total Depth : 21.5

WELL COMPLETION INFORMATION
Screen Dia : . Length : .
Slot Size : . Type : .
Casing Dia : . Length : .

DEPTH IN FEET	DESCRIPTION SURFACE ELEVATION : 45 FEET, USGS TORRANCE, CA	SAMPLE NO.	SAMPLE TYPE	RECOVERY (FEET)	BLOW COUNT	TIME	PID *	GRAPHIC LOG	WELL COMPLETION	WATER LEVEL
	Clayey SAND (SC) soft, black, strong odor.									
5	Sandy CLAY (CL), medium stiff, damp, brown, moderate odor.	5	SS	1.0	39	1100				
10	black-green, strong odor	10	SS	1.0	25	1117				
15	Silty SAND (SM/SC), soft, damp, brown, with very fine grained sand, no odor	15	SS	1.0	24	1130				
20		20	SS	1.0	25	1157				
25	Total depth = 21.5 feet. No free groundwater encountered Boring backfilled with neat concrete cement to ground surface									
30										
35										
40										
45										
50										
55	* PID: PHOTO IONIZATION DETECTOR VALUE (eV)									

SAMPLER TYPE

SS – DRIVEN SPLIT SPOON
ST – PRESSED SHELBY TUBE
RC – ROCK CORE
CT – CONTINUOUS TUBE

BORING METHOD

HSA – HOLLOW STEM AUGER
CFA – CONTINUOUS FLIGHT AUGERS
DC – DRIVING CASING
MD – MUD DRILLING

ENSR

ENSR CONSULTING & ENGINEERING

SUBSURFACE EXPLORATION — LITHOLOGIC LOG OF B-6

Client : AMOCO CHEMICAL CORPORATION
Project Name : AMOCO CHEMICAL
Project Location : TORRANCE
Job Number : 0350-004-100 Boring No : B-6
Logged By : J. NORDENSTAM
Approved By : K. PITCHFORD, C. E. G.
Drilled By : DATUM EXPLORATION

DRILLING AND SAMPLING INFORMATION
Date Started : 6/28/89 Date Completed : 6/28/89
Method : CFA Total Depth : 21.5

WELL COMPLETION INFORMATION
Screen Dia : . Length : .
Slot Size : . Type : .
Casing Dia : . Length : .

DEPTH IN FEET	DESCRIPTION SURFACE ELEVATION : 45 FEET, USGS TORRANCE, CA	SAMPLE NO.	SAMPLE TYPE	RECOVERY (FEET)	BLOW COUNT	TIME	PID *	GRAPHIC LOG	WELL COMPLETION	WATER LEVEL
0	Clayey SAND (SC), soft, damp, black, strong odor.									
5	Clayey SAND (SC), medium dense, brown, moderate odor.	5	SS	0.5	28	1315				
10	slight odor	10	SS	1.0	29	1330				
	SILT (ML), soft, damp, brown, slight odor.									
15		15	SS	1.0	23	1347				
20	continued SILT (ML)	20	SS	1.0	26	1415				
	Total depth = 21.5 feet No free groundwater encountered Boring backfilled with neat concrete cement to ground surface									

* PID PHOTO-IONIZATION DETECTOR VALUE (eV)

SAMPLER TYPE
SS - DRIVEN SPLIT SPOON
ST - PRESSED SHELBY TUBE
RC - ROCK CORE
CT - CONTINUOUS TUBE

BORING METHOD
HSA - HOLLOW STEM AUGER
CFA - CONTINUOUS FLIGHT AUGERS
DC - DRIVING CASING
MD - MUD DRILLING

ENSR

ENSR CONSULTING & ENGINEERING

SUBSURFACE EXPLORATION — LITHOLOGIC LOG OF B-7

Client : AMOCO CHEMICAL CORPORATION
Project Name : AMOCO CHEMICAL
Project Location : TORRANCE
Job Number : 0350-004-100 Boring No : B-7
Logged By : J. NORDENSTAM
Approved By : K. PITCHFORD, C. E. G.
Drilled By : DATUM EXPLORATION

DRILLING AND SAMPLING INFORMATION
Date Started : 6/28/89 Date Completed : 6/28/89
Method : CFA Total Depth : 17.5 FEET

WELL COMPLETION INFORMATION
Screen Dia : . Length : .
Slot Size : . Type : .
Casing Dia : . Length : .

SURFACE ELEVATION : 45 FEET, USGS TORRANCE, CA

DEPTH IN FEET	DESCRIPTION	SAMPLE NO.	SAMPLE TYPE	RECOVERY (FEET)	BLOW COUNT	TIME	PID *	GRAPHIC LOG	WELL COMPLETION	WATER LEVEL
0	Clayey SAND (SC), soft, damp, black, strong odor									
5	Sandy CLAY (CL), medium dense, damp, brown, moderate odor	5	SS	0.5	37	1500				
10	continued (CL)	10	SS	1.5	22	1514				
15	SILT (ML), soft, damp, brown.	15	SS	1.0	18	1550				
20	Total depth = 17.5 feet. No free groundwater encountered Boring backfilled with neat concrete cement to ground surface.									

* PID: PHOTO-IONIZATION DETECTOR VALUE (eV)

SAMPLER TYPE
SS – DRIVEN SPLIT SPOON
ST – PRESSED SHELBY TUBE
RC – ROCK CORE
CT – CONTINUOUS TUBE

BORING METHOD
HSA – HOLLOW STEM AUGER
CFA – CONTINUOUS FLIGHT AUGERS
DC – DRIVING CASING
MD – MUD DRILLING

ENSR

ENSR CONSULTING & ENGINEERING

SUBSURFACE EXPLORATION

LITHOLOGIC LOG OF B-8

Client : AMOCO CHEMICAL COMPANY
Project Name : AMOCO CHEMICAL
Project Location : TORRANCE, CA
Job Number : 0350-004-100 Boring No : B-8
Logged By : J. NORDENSTAM
Approved By : M. WOOD, R.G.
Drilled By : DATUM EXPLORATION

DRILLING AND SAMPLING INFORMATION
Date Started : 6-29-89 Date Completed : 6-29-89
Method : HSA Total Depth : 21.5 FEET

WELL COMPLETION INFORMATION
Screen Dia : . Length : .
Slot Size : . Type : .
Casing Dia : . Length : .

DEPTH IN FEET	DESCRIPTION SURFACE ELEVATION : 45 FEET, USGS TORRANCE, CA	SAMPLE NO.	SAMPLE TYPE	RECOVERY (FEET)	BLOW COUNT	TIME	PID *	GRAPHIC LOG	WELL COMPLETION	WATER LEVEL
0	Silty, fine SAND (SM), clayey, damp, soft, slight odor									
5		5	SS	0.5	50+	0830				
10	continued (SM), moderate odor	10	SS	1.5	28	0845				
15	increase in sand size to fine – medium	15	SS	1.5	18	0905				
20	decrease in sand size to fine	20	SS	1.5	21	0925				
21.5	Bottom of boring at 21.5 feet. No free groundwater encountered Boring backfilled with neat concrete cement to ground surface.									

* PID: PHOTO-IONIZATION DETECTOR VALUE (eV)

SAMPLER TYPE
SS – DRIVEN SPLIT SPOON
ST – PRESSED SHELBY TUBE
RC – ROCK CORE
CT – CONTINUOUS TUBE

BORING METHOD
HSA – HOLLOW STEM AUGER
CFA – CONTINUOUS FLIGHT AUGERS
DC – DRIVING CASING
MD – MUD DRILLING

ENSR CONSULTING & ENGINEERING

SUBSURFACE EXPLORATION

LITHOLOGIC LOG OF B-9

Client : AMOCO CHEMICAL COMPANY
Project Name : AMOCO CHEMICAL
Project Location : TORRANCE, CA
Job Number : 0350-004-100 Boring No : B-9
Logged By : J. NORDENSTAM
Approved By : K. PITCHFORD, C. E. G.
Drilled By : DATUM EXPLORATION

DRILLING AND SAMPLING INFORMATION
Date Started : 6-29-89 Date Completed : 6-29-89
Method : HSA Total Depth : 21.5 FEET

WELL COMPLETION INFORMATION
Screen Dia : . Length : .
Slot Size : . Type : .
Casing Dia : . Length : .

DEPTH IN FEET	DESCRIPTION SURFACE ELEVATION : 45 FEET, USGS TORRANCE, CA	SAMPLE NO.	SAMPLE TYPE	RECOVERY (FEET)	BLOW COUNT	TIME	PID *	GRAPHIC LOG	WELL COMPLETION	WATER LEVEL
	Silty fine to medium SAND (SM), clayey, black, damp, soft									
5	same as above, moderate odor	5	SS	1.5	37	1040				
10	slight odor	10	SS	1.5	30	1105				
15	continued silty, clayey, fine to medium SAND (SM), no odor	15	SS	1.0	13	1145				
20	same as above	20	SS	1.5	31	1210				
25	Bottom of boring at 21.5 feet. No free groundwater encountered. Boring backfilled with neat concrete cement to ground surface.									
30										
35										
40										
45										
50										
55	* PID: PHOTO-IONIZATION DETECTOR VALUE (eV)									

SAMPLER TYPE
SS - DRIVEN SPLIT SPOON
ST - PRESSED SHELBY TUBE
RC - ROCK CORE
CT - CONTINUOUS TUBE

BORING METHOD
HSA - HOLLOW STEM AUGER
CFA - CONTINUOUS FLIGHT AUGERS
DC - DRIVING CASING
MD - MUD DRILLING

ENSR CONSULTING & ENGINEERING

SUBSURFACE EXPLORATION

LITHOLOGIC LOG OF B-10

Client : AMOCO CHEMICAL COMPANY
Project Name : AMOCO CHEMICAL
Project Location : TORRANCE, CA
Job Number : 0350-004-100 Boring No : B-10
Logged By : J. NORDENSTAM
Approved By : K. PITCHFORD, C. E. G.
Drilled By : DATUM EXPLORATION

DRILLING AND SAMPLING INFORMATION
Date Started : 6-29-89 Date Completed : 6-29-89
Method : HSA Total Depth : 21.5' FEET

WELL COMPLETION INFORMATION
Screen Dia : . Length : .
Slot Size : . Type : .
Casing Dia : . Length : .

DEPTH IN FEET	DESCRIPTION SURFACE ELEVATION : 45 FEET, USGS TORRANCE, CA	SAMPLE NO.	SAMPLE TYPE	RECOVERY (FEET)	BLOW COUNT	TIME	PID *	GRAPHIC LOG	WELL COMPLETION	WATER LEVEL
	Clayey fine SAND (SC), silty									
5	increase in sand size to fine - medium	5	SS	1.0	43	1340				
10	continued Silty, clayey fine - medium SAND (SC)	10	SS	1.0	44	1400				
15	same as above	15	SS	1.5	16	1420				
	Silty fine SAND (SM)									
20		20	SS	1.5	28	1500				
	Bottom of boring at 21.5 feet. No free groundwater encountered Boring backfilled with neat concrete cement to ground surface									

* PID: PHOTO-IONIZATION DETECTOR VALUE (eV)

SAMPLER TYPE
SS - DRIVEN SPLIT SPOON
ST - PRESSED SHELBY TUBE
RC - ROCK CORE
CT - CONTINUOUS TUBE

BORING METHOD
HSA - HOLLOW STEM AUGER
CFA - CONTINUOUS FLIGHT AUGERS
DC - DRIVING CASING
MD - MUD DRILLING

ENSR

ENSR CONSULTING & ENGINEERING

SUBSURFACE EXPLORATION

LITHOLOGIC LOG OF B-11

Client : AMOCO CHEMICAL COMPANY
Project Name : AMOCO CHEMICAL
Project Location : TORRANCE, CA
Job Number : 0350-004-100 Boring No : B-11
Logged By : J. NORDENSTAM
Approved By : K. PITCHFORD, C. E. G.
Drilled By : DATUM EXPLORATION

DRILLING AND SAMPLING INFORMATION
Date Started : 6-29-89 Date Completed : 6-29-89
Method : HSA Total Depth : 16.5 FEET

WELL COMPLETION INFORMATION
Screen Dia : . Length : .
Slot Size : . Type : .
Casing Dia : . Length : .

DEPTH IN FEET	DESCRIPTION SURFACE ELEVATION : 45 FEET, USGS TORRANCE, CA	SAMPLE NO.	SAMPLE TYPE	RECOVERY (FEET)	BLOW COUNT	TIME	PID *	GRAPHIC LOG	WELL COMPLETION	WATER LEVEL
	plastic upper 12 inches Silty fine SAND (SM), clayey, black, damp, soft strong odor									
5	increase in sand size to fine - medium	5	SS	1.5	50+	1540				
10	same as above	10	SS	1.5	36	1600				
15	same as above	15	SS	1.5	23	1630				
	Boring terminated at 16.5 feet due to auger refusal. No free groundwater encountered Boring backfilled with neat concrete cement to ground surface.									
20										
25										
30										
35										
40										
45										
50										
55	* PID: PHOTO-IONIZATION DETECTOR VALUE (eV)									

SAMPLER TYPE
SS - DRIVEN SPLIT SPOON
ST - PRESSED SHELBY TUBE
RC - ROCK CORE
CT - CONTINUOUS TUBE

BORING METHOD
HSA - HOLLOW STEM AUGER
CFA - CONTINUOUS FLIGHT AUGERS
DC - DRIVING CASING
MD - MUD DRILLING

ENSR

ENSR CONSULTING & ENGINEERING

SUBSURFACE EXPLORATION

LITHOLOGIC LOG OF B-12

Client : AMOCO CHEMICAL COMPANY
Project Name : AMOCO CHEMICAL
Project Location : TORRANCE, CA
Job Number : 0350-004-100 Boring No : B-12
Logged By : C. KELLER
Approved By : K. PITCHFORD, C. E. G.
Drilled By : DATUM EXPLORATION

DRILLING AND SAMPLING INFORMATION
Date Started : 6-30-89 Date Completed : 6-30-89
Method : HSA Total Depth : 20 FEET

WELL COMPLETION INFORMATION
Screen Dia : . Length : .
Slot Size : . Type : .
Casing Dia : . Length : .

DEPTH IN FEET	DESCRIPTION SURFACE ELEVATION : 45 FEET, USGS TORRANCE, CA	SAMPLE NO.	SAMPLE TYPE	RECOVERY (FEET)	BLOW COUNT	TIME	PID *	GRAPHIC LOG	WELL COMPLETION	WATER LEVEL
0	SILT (ML) dark green to black, wet to saturated, soft									
5	Sandy SILT (ML) dark green, dry to damp, hard	5	SS	0.5	50+	0830				
10		10	SS	1.0	31	0850				
15	continued Sandy SILT (ML), with increase in sand	15	SS	1.0	13	0930				
	Silty SAND (SM) tan to brown, dry to damp, loose to medium dense									
	SILT (ML) tan to brown, dry to damp, hard, contains some sand and clay									
20		20	SS	1.0	24	0950				
	Bottom of boring at 20 feet. No free groundwater encountered Boring backfilled with neat concrete cement to ground surface.									
25										
30										
35										
40										
45										
50										
55	* PID: PHOTO-IONIZATION DETECTOR VALUE (eV)									

SAMPLER TYPE
SS – DRIVEN SPLIT SPOON
ST – PRESSED SHELBY TUBE
RC – ROCK CORE
CT – CONTINUOUS TUBE

BORING METHOD
HSA – HOLLOW STEM AUGER
CFA – CONTINUOUS FLIGHT AUGERS
DC – DRIVING CASING
MD – MUD DRILLING

ENSR

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SUBSURFACE EXPLORATION — LITHOLOGIC LOG OF B-13

Client : AMOCO CHEMICAL COMPANY
Project Name : AMOCO CHEMICAL
Project Location : TORRANCE, CA
Job Number : 0350-004-100 Boring No : B-13
Logged By : C. KELLER
Approved By : K. PITCHFORD, C. E. G.
Drilled By : DATUM EXPLORATION

DRILLING AND SAMPLING INFORMATION
Date Started : 6-30-89 Date Completed : 6-30-89
Method : HSA Total Depth : 20 FEET

WELL COMPLETION INFORMATION
Screen Dia : . Length : .
Slot Size : . Type : .
Casing Dia : . Length : .

DEPTH IN FEET	DESCRIPTION SURFACE ELEVATION : 45 FEET, USGS TORRANCE, CA	SAMPLE NO.	SAMPLE TYPE	RECOVERY (FEET)	BLOW COUNT	TIME	PID *	GRAPHIC LOG	WELL COMPLETION	WATER LEVEL
0–5	Silty CLAY (CL), dark green, damp to moist, soft strong sweet odor									
5	Silty SAND (SM), clayey, dark green, damp, loose to medium dense, no odor	5	SS	1.5	19	1025				
10		10	SS	1.5	21	1045				
11	Sandy SILT (ML), clayey, dark green, damp, medium dense									
15	contiunued SILT (ML) becomes reddish-brown	15	SS	1.5	39	1100				
18	SAND (SM) brown, damp, loose to medium dense, some silt									
20		20	SS	1.5	36	1130				
20	Bottom of boring at 20 feet. No free groundwater encountered Boring backfilled with neat concrete cement to ground surface.									

Depth scale: 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55

* PID: PHOTO-IONIZATION DETECTOR VALUE (eV)

SAMPLER TYPE
SS – DRIVEN SPLIT SPOON
ST – PRESSED SHELBY TUBE
RC – ROCK CORE
CT – CONTINUOUS TUBE

BORING METHOD
HSA – HOLLOW STEM AUGER
CFA – CONTINUOUS FLIGHT AUGERS
DC – DRIVING CASING
MD – MUD DRILLING

ENSR

ENSR CONSULTING & ENGINEERING

SUBSURFACE EXPLORATION

LITHOLOGIC LOG OF B-14

Client : AMOCO CHEMICAL COMPANY
Project Name : AMOCO CHEMICAL
Project Location : TORRANCE, CA
Job Number : 0350-004-100 Boring No : B-14
Logged By : C. KELLER
Approved By : K. PITCHFORD, C. E. G.
Drilled By : DATUM EXPLORATION

DRILLING AND SAMPLING INFORMATION
Date Started : 6-30-89 Date Completed : 6-30-89
Method : HSA Total Depth : 20 FEET

WELL COMPLETION INFORMATION
Screen Dia : . Length : .
Slot Size : . Type : .
Casing Dia : . Length : .

DEPTH IN FEET	DESCRIPTION SURFACE ELEVATION : 45 FEET, USGS TORRANCE, CA	SAMPLE NO.	SAMPLE TYPE	RECOVERY (FEET)	BLOW COUNT	TIME	PID *	GRAPHIC LOG	WELL COMPLETION	WATER LEVEL
0	Silty fine SAND (SM), dark green, damp, soft									
5		5	SS	1.0	25	1215				
10	continued silty SAND (SM), with minor clay, moderate to strong odor	10	SS	1.5	37	1240				
15	Silty, fine to medium SAND (SM), brown, dry to damp, moderate to strong odor	15	SS	1.0	19	1320				
20		20	SS	1.5	34	1350				
	Bottom of boring at 20 feet. No free groundwater encountered Boring backfilled with neat concrete cement to ground surface.									
25										
30										
35										
40										
45										
50										
55	* PID: PHOTO-IONIZATION DETECTOR VALUE (eV)									

SAMPLER TYPE
SS - DRIVEN SPLIT SPOON
ST - PRESSED SHELBY TUBE
RC - ROCK CORE
CT - CONTINUOUS TUBE

BORING METHOD
HSA - HOLLOW STEM AUGER
CFA - CONTINUOUS FLIGHT AUGERS
DC - DRIVING CASING
MD - MUD DRILLING

APPENDIX B

CHAIN-OF-CUSTODY FORMS

CHAIN OF CUSTODY RECORD

Client/Project Name	Project Location	Project No.	Field Logbook No.	Sampler: (Signature)	Chain of Custody Tape No.
[illegible]	[illegible]	0350-[illegible]		[illegible]	

Sample No./ Identification	Date	Time	Lab Sample Number	Type of Sample	ANALYSES: [illegible]	ANALYSES: HOLD					REMARKS
[illegible]-1-5'	6/27/89			Soil		X					
[illegible]-1-10					X						
[illegible]-1-15'					X						
[illegible]-1-20'						X					
[illegible]-2-5						X					
[illegible]-2-[illegible]					X						
[illegible]-2-15					X						
[illegible]-2-20						X					

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
[illegible]	6/27/89	5:53	Mark Weiner	6/27/89	5:55pm
Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
Relinquished by: (Signature)	Date	Time	Received for Laboratory: (Signature)	Date	Time

Sample Disposal Method:	Disposed of by: (Signature)	Date	Time

SAMPLE COLLECTOR Attn: Mark Wood
ENSR CORPORATION
19782 MacArthur Blvd., STE 365
Irvine, CA 92715
(714) 476-0321

ANALYTICAL LABORATORY
Del Mar Analytical

ENSR

[illegible] 2

1974-3-84

CHAIN OF CUSTODY RECORD

Client/Project Name	Project Location	ANALYSES
AMOCO	Torrance CA	
Project No. 0350-004-100	Field Logbook No.	
Sampler: (Signature) Mark Wood	Chain of Custody Tape No.	

Sample No./ Identification	Date	Time	Lab Sample Number	Type of Sample	8240	Hold					REMARKS
B-4-5	6/28/89	~~6:00~~		Soil		X					styrene/ethylbenze
B-4-10					X						
B-4-15						X					
B-4-20					X						
B-5-5						X					
B-5-10					X						
B-5-15						X					
B-5-20					X						

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
Mark Wood	6/28/89	6:00			
Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
Relinquished by: (Signature)	Date	Time	Received for Laboratory: (Signature) Mark Weiner	6/29/89	6:00
Sample Disposal Method:			Disposed of by: (Signature)	Date	Time

SAMPLE COLLECTOR Attn Mark Wood

ENSR CORPORATION
19782 MacArthur Blvd., STE 365
Irvine, CA 92715
(714) 476-0321

ANALYTICAL LABORATORY
Del Mar Analytical

ENSR

1974-3-84

CHAIN OF CUSTODY RECORD

Client/Project Name	Project Location
AMOCO	Torrance CA

Project No.	Field Logbook No.
0350-004-100	

Sampler: (Signature)	Chain of Custody Tape No.
Mark Wood	

ANALYSES

Sample No./ Identification	Date	Time	Lab Sample Number	Type of Sample	8240	Hold					REMARKS
B-6-5	6/28/89			Soil		X					
B-6-10						X					
B-6-15					X						
B-6-20					X						
B-7-5						X					
B-7-10					X						
B-7-15					X						

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
Mark Wood	6/28/89	6:00			

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time

Relinquished by: (Signature)	Date	Time	Received for Laboratory: (Signature)	Date	Time
			[illegible]	6/28/89	6:00

Sample Disposal Method:	Disposed of by: (Signature)	Date	Time

SAMPLE COLLECTOR Attn. M. Wood

ENSR CORPORATION
19782 MacArthur Blvd., STE 365
Irvine, CA 92715
(714) 476-0321

ANALYTICAL LABORATORY
Del Mar Analytical

ENSR

1974-3-84

CHAIN OF CUSTODY RECORD

Client/Project Name	Project Location
AMOCO CHEMICAL	TORRANCE

Project No.	Field Logbook No.
0350-004-100	

Sampler: (*Signature*)	Chain of Custody Tape No.
[signature]	

ANALYSES

Sample No./ Identification	Date	Time	Lab Sample Number	Type of Sample	EPA METHOD 8240	HOLD					REMARKS
B-8 5'	6/20/89	8:30		SOIL		X					
B-8 10'		8:45				X					
B-8 15'		9:05			X						
B-8 20'		9:25			X						
B-9 5'		10:40				X					
B-9 10'		11:05				X					
B-9 15'		11:45			X						
B-9 20'		12:10			X						

Relinquished by: (*Signature*)	Date	Time	Received by: (*Signature*)	Date	Time
[signature]	6/20	850 AM			
Relinquished by: (*Signature*)	Date	Time	Received by: (*Signature*) [signature]	Date 6/30	Time 8:52
Relinquished by: (*Signature*)	Date	Time	Received for Laboratory: (*Signature*)	Date	Time
Sample Disposal Method:			Disposed of by: (*Signature*)	Date	Time

SAMPLE COLLECTOR	ANALYTICAL LABORATORY	
ENSR CORPORATION 19782 MacArthur Blvd., STE 365 Irvine, CA 92715 (714) 476-0321	DEL MAR	ENSR

1974-3-84

CHAIN OF CUSTODY RECORD

Client/Project Name	Project Location
Amoco Chemical	[illegible]
Project No.	**Field Logbook No.**
0350-004-100	
Sampler: (*Signature*)	**Chain of Custody Tape No.**
[signature]	

ANALYSES

Sample No./ Identification	Date	Time	Lab Sample Number	Type of Sample	EPA Method 8015	Hold					REMARKS
B-10 5'	6-27-??	1:40		SOIL		X					
B-10 10'		2:00				X					
B-10 15'		2:20			X						
B-10 20'		3:00			X						
B-11 5'		3:40				[illegible]					
B-11 10'		4:00			X						
B-11 15'		4:30			X						

Relinquished by: (*Signature*)	Date	Time	Received by: (*Signature*)	Date	Time
[signature]	6/30	850 AM			
Relinquished by: (*Signature*)	**Date**	**Time**	**Received by: (*Signature*)**	**Date**	**Time**
			E. [signature]	6/30	8:52
Relinquished by: (*Signature*)	**Date**	**Time**	**Received for Laboratory: (*Signature*)**	**Date**	**Time**

Sample Disposal Method:	Disposed of by: (*Signature*)	Date	Time

SAMPLE COLLECTOR	ANALYTICAL LABORATORY	
ENSR CORPORATION 19782 MacArthur Blvd., STE 365 Irvine, CA 92715 (714) 476-0321	[illegible]	ENSR

1974-3-84

CHAIN OF CUSTODY RECORD

Client/Project Name	Project Location
Amco Chemical Co.	Torrance, CA
Project No. 0350-004-100	Field Logbook No.
Sampler: (*Signature*) Bill Lunn	Chain of Custody Tape No.

ANALYSES

Sample No./ Identification	Date	Time	Lab Sample Number	Type of Sample							REMARKS
B-12-5	6/30/89			Soil							HOLD
B-12-10											
B-13-5											
B-13-10											
B-14-5											
B-14-10											

Relinquished by: (*Signature*)	Date	Time	Received by: (*Signature*)	Date	Time
Bill Lunn			E. Schuchalle	6/30	4:30
Relinquished by: (*Signature*)	Date	Time	Received by: (*Signature*) Sue Spinner	Date 6/30	Time 4:30
Relinquished by: (*Signature*)	Date	Time	Received for Laboratory: (*Signature*)	Date	Time
Sample Disposal Method:			Disposed of by: (*Signature*)	Date	Time

SAMPLE COLLECTOR

ENSR CORPORATION
19782 MacArthur Blvd., STE 365
Irvine, CA 92715
(714) 476-0321

ANALYTICAL LABORATORY

DEL MAR LABORATORY

IRVINE, CA

ENSR

1974 3-84

APPENDIX C

LABORATORY REPORTS

Del Mar Analytical
18102 Sky Park South, Suite F • Irvine, CA 92714
(714) 261-1022 • FAX (714) 261-1228

JUL 21 1989

ENSR Corporation
19782 MacArthur Blvd., Suite 365
Irvine, CA 92715

Date Sampled: 06/27/89
Date Received: 06/27/89
Date Analyzed: 07/07/89
Date Reported: 07/10/89

Attention: Mark Wood

Project: 0350-004-100, Amoco

Sample Description
Soil Sample B-1 @ 10'

Sample Number
9060917

Volatile Organics by Mass Spectrometry

	Detection Limit ug/Kg	Sample Results ug/Kg
Tetrachloroethene	50	N.D.
1,1,1-Trichloroethane	50	N.D.
Trichloroethene	50	100
1,1-Dichloroethane	50	N.D.
1,2-Dichloroethane	50	N.D.
1,1-Dichloroethene	50	N.D.
trans-1,2 Dichloroethene	50	N.D.
Methylene Chloride	50	N.D.
Chloroform	50	N.D.
Bromodichloromethane	50	N.D.
Dibromochloromethane	50	N.D.
Bromoform	50	N.D.
Bromomethane	50	N.D.
Chloromethane	50	N.D.
Chloroethane	50	N.D.
Vinyl Chloride	50	N.D.
1,2-Dichloropropane	50	N.D.
1,3-Dichloropropenes	50	N.D.
Carbon Tetrachloride	50	N.D.
Trichlorofluoromethane	250	N.D.
1,1,2-Trichloroethane	50	N.D.
1,1,2,2-Tetrachloroethane	50	N.D.
2-Chloroethylvinyl ether	50	N.D.

N.D. = None Detected above stated Detection Limit

Del Mar Analytical
Gary Steube
Laboratory Director

Method of Analysis: EPA 8240

Del Mar Analytical
18102 Sky Park South, Suite F • Irvine, CA 92714
(714) 261-1022 • FAX (714) 261-1228

ENSR Corporation
19782 MacArthur Blvd., Suite 365
Irvine, CA 92715

Date Sampled: 06/27/89
Date Received: 06/27/89
Date Analyzed: 07/07/89
Date Reported: 07/10/89

Attention: Mark Wood

Project: 0350-004-100, Amoco

Sample Description
Soil Sample B-1 @ 10'

Sample Number
9060917

Volatile Organics by Mass Spectrometry

	Detection Limit ug/Kg	Sample Results ug/Kg
Benzene	50	N.D.
Toluene	50	N.D.
Ethylbenzene	50	N.D.
Chlorobenzene	50	N.D.
Xylenes (sum of 3 isomers)	50	N.D.
Acetone	250	N.D.
2-Butanone	250	N.D
Carbon Disulfide	100	N.D.
Vinyl Acetate	100	N.D.
4-Methyl-2-pentanone	100	N.D.
2-Hexanone	100	N.D.
Styrene	100	N.D.

N.D. = None Detected above stated Detection Limit

Surrogate Recovery:

1,2-Dichloroethane-d4	100 %
Toluene-d8	103 %
4-Bromofluorobenzene	101 %

Del Mar Analytical
Gary Steube
Laboratory Director

Method of Analysis: EPA 8240

Del Mar Analytical
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(714) 261-1022 • FAX (714) 261-1228

ENSR Corporation
19782 MacArthur Blvd., Suite 365
Irvine, CA 92715

Date Sampled: 06/27/89
Date Received: 06/27/89
Date Analyzed: 07/07/89
Date Reported: 07/10/89

Attention: Mark Wood

Project: 0350-004-100, Amoco

Sample Description
Soil Sample B-1 @ 15'

Sample Number
9060918

Volatile Organics by Mass Spectrometry

	Detection Limit ug/Kg	Sample Results ug/Kg
Tetrachloroethene	50	N.D.
1,1,1-Trichloroethane	50	N.D.
Trichloroethene	50	N.D.
1,1-Dichloroethane	50	N.D.
1,2-Dichloroethane	50	N.D.
1,1-Dichloroethene	50	N.D.
trans-1,2 Dichloroethene	50	N.D.
Methylene Chloride	50	N.D.
Chloroform	50	N.D.
Bromodichloromethane	50	N.D.
Dibromochloromethane	50	N.D.
Bromoform	50	N.D.
Bromomethane	50	N.D.
Chloromethane	50	N.D.
Chloroethane	50	N.D.
Vinyl Chloride	50	N.D.
1,2-Dichloropropane	50	N.D.
1,3-Dichloropropenes	50	N.D.
Carbon Tetrachloride	50	N.D.
Trichlorofluoromethane	250	N.D.
1,1,2-Trichloroethane	50	N.D.
1,1,2,2-Tetrachloroethane	50	N.D.
2-Chloroethylvinyl ether	50	N.D.

N.D. = None Detected above stated Detection Limit

Del Mar Analytical

Gary Steube
Laboratory Director

Method of Analysis: EPA 8240

Del Mar Analytical
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(714) 261-1022 • FAX (714) 261-1228

ENSR Corporation
19782 MacArthur Blvd., Suite 365
Irvine, CA 92715

Date Sampled: 06/27/89
Date Received: 06/27/89
Date Analyzed: 07/07/89
Date Reported: 07/10/89

Attention: Mark Wood

Project: 0350-004-100, Amoco

Sample Description	Sample Number
Soil Sample B-1 @ 15'	9060918

Volatile Organics by Mass Spectrometry

	Detection Limit ug/Kg	Sample Results ug/Kg
Benzene	50	N.D.
Toluene	50	N.D.
Ethylbenzene	50	N.D.
Chlorobenzene	50	N.D.
Xylenes (sum of 3 isomers)	50	N.D.
Acetone	250	N.D.
2-Butanone	250	N.D
Carbon Disulfide	100	N.D.
Vinyl Acetate	100	N.D.
4-Methyl-2-pentanone	100	N.D.
2-Hexanone	100	N.D.
Styrene	100	N.D.

N.D. = None Detected above stated Detection Limit

Surrogate Recovery:

1,2-Dichloroethane-d4	89 %
Toluene-d8	90 %
4-Bromofluorobenzene	90 %

Del Mar Analytical
Gary Steube
Laboratory Director

Method of Analysis: EPA 8240

Del Mar Analytical
18102 Sky Park South, Suite F • Irvine, CA 92714
(714) 261-1022 • FAX (714) 261-1228

ENSR Corporation
19782 MacArthur Blvd., Suite 365
Irvine, CA 92715

Date Sampled: 06/27/89
Date Received: 06/27/89
Date Analyzed: 07/07/89
Date Reported: 07/10/89

Attention: Mark Wood

Project: 0350-004-100, Amoco

Sample Description
Soil Sample B-2 @ 10'

Sample Number
9060919

Volatile Organics by Mass Spectrometry

	Detection Limit ug/Kg	Sample Results ug/Kg
Tetrachloroethene	50	N.D.
1,1,1-Trichloroethane	50	N.D.
Trichloroethene	50	N.D.
1,1-Dichloroethane	50	N.D.
1,2-Dichloroethane	50	N.D.
1,1-Dichloroethene	50	N.D.
trans-1,2 Dichloroethene	50	N.D.
Methylene Chloride	50	N.D.
Chloroform	50	N.D.
Bromodichloromethane	50	N.D.
Dibromochloromethane	50	N.D.
Bromoform	50	N.D.
Bromomethane	50	N.D.
Chloromethane	50	N.D.
Chloroethane	50	N.D.
Vinyl Chloride	50	N.D.
1,2-Dichloropropane	50	N.D.
1,3-Dichloropropenes	50	N.D.
Carbon Tetrachloride	50	N.D.
Trichlorofluoromethane	250	N.D.
1,1,2-Trichloroethane	50	N.D.
1,1,2,2-Tetrachloroethane	50	N.D.
2-Chloroethylvinyl ether	50	N.D.

N.D. = None Detected above stated Detection Limit

Del Mar Analytical

Gary Steube
Laboratory Director

Method of Analysis: EPA 8240

Del Mar Analytical
18102 Sky Park South, Suite F • Irvine, CA 92714
(714) 261-1022 • FAX (714) 261-1228

ENSR Corporation
19782 MacArthur Blvd., Suite 365
Irvine, CA 92715

Date Sampled: 06/27/89
Date Received: 06/27/89
Date Analyzed: 07/07/89
Date Reported: 07/10/89

Attention: Mark Wood

Project: 0350-004-100, Amoco

Sample Description
Soil Sample B-2 @ 10'

Sample Number
9060919

Volatile Organics by Mass Spectrometry

	Detection Limit ug/Kg	Sample Results ug/Kg
Benzene	50	N.D.
Toluene	50	N.D.
Ethylbenzene	50	N.D.
Chlorobenzene	50	N.D.
Xylenes (sum of 3 isomers)	50	N.D.
Acetone	250	N.D.
2-Butanone	250	N.D
Carbon Disulfide	100	N.D.
Vinyl Acetate	100	N.D.
4-Methyl-2-pentanone	100	N.D.
2-Hexanone	100	N.D.
Styrene	100	N.D.

N.D. = None Detected above stated Detection Limit

Surrogate Recovery:

1,2-Dichloroethane-d4	87 %
Toluene-d8	89 %
4-Bromofluorobenzene	87 %

Del Mar Analytical

Gary Steube
Laboratory Director

Method of Analysis: EPA 8240

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ENSR Corporation
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Irvine, CA 92715

Date Sampled: 06/27/89
Date Received: 06/27/89
Date Analyzed: 07/07/89
Date Reported: 07/10/89

Attention: Mark Wood

Project: 0350-004-100, Amoco

Sample Description
Soil Sample B-2 @ 15'

Sample Number
9060920

Volatile Organics by Mass Spectrometry

	Detection Limit ug/Kg	Sample Results ug/Kg
Tetrachloroethene	50	N.D.
1,1,1-Trichloroethane	50	N.D.
Trichloroethene	50	N.D.
1,1-Dichloroethane	50	N.D.
1,2-Dichloroethane	50	N.D.
1,1-Dichloroethene	50	N.D.
trans-1,2 Dichloroethene	50	N.D.
Methylene Chloride	50	N.D.
Chloroform	50	N.D.
Bromodichloromethane	50	N.D.
Dibromochloromethane	50	N.D.
Bromoform	50	N.D.
Bromomethane	50	N.D.
Chloromethane	50	N.D.
Chloroethane	50	N.D.
Vinyl Chloride	50	N.D.
1,2-Dichloropropane	50	N.D.
1,3-Dichloropropenes	50	N.D.
Carbon Tetrachloride	50	N.D.
Trichlorofluoromethane	250	N.D.
1,1,2-Trichloroethane	50	N.D.
1,1,2,2-Tetrachloroethane	50	N.D.
2-Chloroethylvinyl ether	50	N.D.

N.D. = None Detected above stated Detection Limit

Del Mar Analytical
Gary Steube
Laboratory Director

Method of Analysis: EPA 8240

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Date Reported: 07/10/89

Attention: Mark Wood

Project: 0350-004-100, Amoco

Sample Description
Soil Sample B-3 @ 10'

Sample Number
9060921

Volatile Organics by Mass Spectrometry

	Detection Limit ug/Kg	Sample Results ug/Kg
Tetrachloroethene	50	N.D.
1,1,1-Trichloroethane	50	N.D.
Trichloroethene	50	N.D.
1,1-Dichloroethane	50	N.D.
1,2-Dichloroethane	50	N.D.
1,1-Dichloroethene	50	N.D.
trans-1,2 Dichloroethene	50	N.D.
Methylene Chloride	50	N.D.
Chloroform	50	N.D.
Bromodichloromethane	50	N.D.
Dibromochloromethane	50	N.D.
Bromoform	50	N.D.
Bromomethane	50	N.D.
Chloromethane	50	N.D.
Chloroethane	50	N.D.
Vinyl Chloride	50	N.D.
1,2-Dichloropropane	50	N.D.
1,3-Dichloropropenes	50	N.D.
Carbon Tetrachloride	50	N.D.
Trichlorofluoromethane	250	N.D.
1,1,2-Trichloroethane	50	N.D.
1,1,2,2-Tetrachloroethane	50	N.D.
2-Chloroethylvinyl ether	50	N.D.

N.D. = None Detected above stated Detection Limit

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Method of Analysis: EPA 8240

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Date Reported: 07/10/89

Attention: Mark Wood

Project: 0350-004-100, Amoco

<u>Sample Description</u>
Soil Sample B-2 @ 15'

<u>Sample Number</u>
9060920

Volatile Organics by Mass Spectrometry

	Detection Limit ug/Kg	Sample Results ug/Kg
Benzene	50	N.D.
Toluene	50	N.D.
Ethylbenzene	50	N.D.
Chlorobenzene	50	N.D.
Xylenes (sum of 3 isomers)	50	N.D.
Acetone	250	N.D.
2-Butanone	250	N.D
Carbon Disulfide	100	N.D.
Vinyl Acetate	100	N.D.
4-Methyl-2-pentanone	100	N.D.
2-Hexanone	100	N.D.
Styrene	100	N.D.

N.D. = None Detected above stated Detection Limit

Surrogate Recovery:

1,2-Dichloroethane-d4	92 %
Toluene-d8	89 %
4-Bromofluorobenzene	87 %

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Date Analyzed: 07/07/89
Date Reported: 07/10/89

Attention: Mark Wood

Project: 0350-004-100, Amoco

Sample Description	Sample Number
Soil Sample B-3 @ 10'	9060921

Volatile Organics by Mass Spectrometry

	Detection Limit ug/Kg	Sample Results ug/Kg
Tetrachloroethene	50	N.D.
1,1,1-Trichloroethane	50	N.D.
Trichloroethene	50	N.D.
1,1-Dichloroethane	50	N.D.
1,2-Dichloroethane	50	N.D.
1,1-Dichloroethene	50	N.D.
trans-1,2 Dichloroethene	50	N.D.
Methylene Chloride	50	N.D.
Chloroform	50	N.D.
Bromodichloromethane	50	N.D.
Dibromochloromethane	50	N.D.
Bromoform	50	N.D.
Bromomethane	50	N.D.
Chloromethane	50	N.D.
Chloroethane	50	N.D.
Vinyl Chloride	50	N.D.
1,2-Dichloropropane	50	N.D.
1,3-Dichloropropenes	50	N.D.
Carbon Tetrachloride	50	N.D.
Trichlorofluoromethane	250	N.D.
1,1,2-Trichloroethane	50	N.D.
1,1,2,2-Tetrachloroethane	50	N.D.
2-Chloroethylvinyl ether	50	N.D.

N.D. = None Detected above stated Detection Limit

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Method of Analysis: EPA 8240

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Attention: Mark Wood

Project: 0350-004-100, Amoco

Sample Description
Soil Sample B-3 @ 10'

Sample Number
9060921

Volatile Organics by Mass Spectrometry

	Detection Limit ug/Kg	Sample Results ug/Kg
Benzene	50	N.D.
Toluene	50	N.D.
Ethylbenzene	50	N.D.
Chlorobenzene	50	N.D.
Xylenes (sum of 3 isomers)	50	N.D.
Acetone	250	N.D.
2-Butanone	250	N.D
Carbon Disulfide	100	N.D.
Vinyl Acetate	100	N.D.
4-Methyl-2-pentanone	100	N.D.
2-Hexanone	100	N.D.
Styrene	100	N.D.

N.D. = None Detected above stated Detection Limit

Surrogate Recovery:

1,2-Dichloroethane-d4	100 %
Toluene-d8	103 %
4-Bromofluorobenzene	101 %

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Method of Analysis: EPA 8240

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Date Reported: 07/10/89

Attention: Mark Wood

Project: 0350-004-100, Amoco

Sample Description
Soil Sample B-3 @ 15'

Sample Number
9060922

Volatile Organics by Mass Spectrometry

	Detection Limit ug/Kg	Sample Results ug/Kg
Tetrachloroethene	50	N.D.
1,1,1-Trichloroethane	50	N.D.
Trichloroethene	50	N.D.
1,1-Dichloroethane	50	N.D.
1,2-Dichloroethane	50	N.D.
1,1-Dichloroethene	50	N.D.
trans-1,2 Dichloroethene	50	N.D.
Methylene Chloride	50	N.D.
Chloroform	50	N.D.
Bromodichloromethane	50	N.D.
Dibromochloromethane	50	N.D.
Bromoform	50	N.D.
Bromomethane	50	N.D.
Chloromethane	50	N.D.
Chloroethane	50	N.D.
Vinyl Chloride	50	N.D.
1,2-Dichloropropane	50	N.D.
1,3-Dichloropropenes	50	N.D.
Carbon Tetrachloride	50	N.D.
Trichlorofluoromethane	250	N.D.
1,1,2-Trichloroethane	50	N.D.
1,1,2,2-Tetrachloroethane	50	N.D.
2-Chloroethylvinyl ether	50	N.D.

N.D. = None Detected above stated Detection Limit

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Method of Analysis: EPA 8240

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Attention: Mark Wood

Project: 0350-004-100, Amoco

Sample Description
Soil Sample B-3 @ 15'

Sample Number
9060922

Volatile Organics by Mass Spectrometry

	Detection Limit ug/Kg	Sample Results ug/Kg
Benzene	50	N.D.
Toluene	50	N.D.
Ethylbenzene	50	N.D.
Chlorobenzene	50	N.D.
Xylenes (sum of 3 isomers)	50	N.D.
Acetone	250	N.D.
2-Butanone	250	N.D
Carbon Disulfide	100	N.D.
Vinyl Acetate	100	N.D.
4-Methyl-2-pentanone	100	N.D.
2-Hexanone	100	N.D.
Styrene	100	N.D.

N.D. = None Detected above stated Detection Limit

Surrogate Recovery:

1,2-Dichloroethane-d4	100 %
Toluene-d8	103 %
4-Bromofluorobenzene	101 %

Del Mar Analytical

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Method of Analysis: EPA 8240

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Date Reported: 07/11/89

Attention: Mark Wood

Project: 0350-004-100, Amoco

Sample Description
Soil Sample B-4-10

Sample Number
9060988

Volatile Organics by Mass Spectrometry

	Detection Limit ug/Kg	Sample Results ug/Kg
Tetrachloroethene	50	N.D.
1,1,1-Trichloroethane	50	N.D.
Trichloroethene	50	N.D.
1,1-Dichloroethane	50	N.D.
1,2-Dichloroethane	50	N.D.
1,1-Dichloroethene	50	N.D.
trans-1,2 Dichloroethene	50	N.D.
Methylene Chloride	50	N.D.
Chloroform	50	N.D.
Bromodichloromethane	50	N.D.
Dibromochloromethane	50	N.D.
Bromoform	50	N.D.
Bromomethane	50	N.D.
Chloromethane	50	N.D.
Chloroethane	50	N.D.
Vinyl Chloride	50	N.D.
1,2-Dichloropropane	50	N.D.
1,3-Dichloropropenes	50	N.D.
Carbon Tetrachloride	50	N.D.
Trichlorofluoromethane	250	N.D.
1,1,2-Trichloroethane	50	N.D.
1,1,2,2-Tetrachloroethane	50	N.D.
2-Chloroethylvinyl ether	50	N.D.

N.D. = None Detected above stated Detection Limit

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Method of Analysis: EPA 8240

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Date Analyzed: 07/10/89
Date Reported: 07/11/89

Attention: Mark Wood

Project: 0350-004-100, Amoco

Sample Description	Sample Number
B-4-10	9060988

Volatile Organics by Mass Spectrometry

	Detection Limit ug/Kg	Sample Results ug/Kg
Benzene	50	N.D.
Toluene	50	N.D.
Ethylbenzene	50	N.D.
Chlorobenzene	50	N.D.
Xylenes (sum of 3 isomers)	50	N.D.
Acetone	250	N.D.
2-Butanone	250	N.D
Carbon Disulfide	100	N.D.
Vinyl Acetate	100	N.D.
4-Methyl-2-pentanone	100	N.D.
2-Hexanone	100	N.D.
Styrene	100	N.D.

N.D. = None Detected above stated Detection Limit

Surrogate Recovery:

1,2-Dichloroethane-d4	88 %
Toluene-d8	85 %
4-Bromofluorobenzene	86 %

Del Mar Analytical
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Method of Analysis: EPA 8240

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Date Reported: 07/11/89

Attention: Mark Wood

Project: 0350-004-100, Amoco

<u>Sample Description</u>
Soil Sample B-4-20

<u>Sample Number</u>
9060989

Volatile Organics by Mass Spectrometry

	Detection Limit ug/Kg	Sample Results ug/Kg
Tetrachloroethene	50	N.D.
1,1,1-Trichloroethane	50	N.D.
Trichloroethene	50	N.D.
1,1-Dichloroethane	50	N.D.
1,2-Dichloroethane	50	N.D.
1,1-Dichloroethene	50	N.D.
trans-1,2 Dichloroethene	50	N.D.
Methylene Chloride	50	N.D.
Chloroform	50	N.D.
Bromodichloromethane	50	N.D.
Dibromochloromethane	50	N.D.
Bromoform	50	N.D.
Bromomethane	50	N.D.
Chloromethane	50	N.D.
Chloroethane	50	N.D.
Vinyl Chloride	50	N.D.
1,2-Dichloropropane	50	N.D.
1,3-Dichloropropenes	50	N.D.
Carbon Tetrachloride	50	N.D.
Trichlorofluoromethane	250	N.D.
1,1,2-Trichloroethane	50	N.D.
1,1,2,2-Tetrachloroethane	50	N.D.
2-Chloroethylvinyl ether	50	N.D.

N.D. = None Detected above stated Detection Limit

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Method of Analysis: EPA 8240

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Attention: Mark Wood

Project: 0350-004-100, Amoco

Sample Description
B-4-20

Sample Number
9060989

Volatile Organics by Mass Spectrometry

	Detection Limit ug/Kg	Sample Results ug/Kg
Benzene	50	N.D.
Toluene	50	N.D.
Ethylbenzene	50	N.D.
Chlorobenzene	50	N.D.
Xylenes (sum of 3 isomers)	50	N.D.
Acetone	250	N.D.
2-Butanone	250	N.D
Carbon Disulfide	100	N.D.
Vinyl Acetate	100	N.D.
4-Methyl-2-pentanone	100	N.D.
2-Hexanone	100	N.D.
Styrene	100	N.D.

N.D. = None Detected above stated Detection Limit

Surrogate Recovery:

1,2-Dichloroethane-d4	92 %
Toluene-d8	90 %
4-Bromofluorobenzene	88 %

Del Mar Analytical

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Laboratory Director

Method of Analysis: EPA 8240

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Date Reported: 07/11/89

Attention: Mark Wood

Project: 0350-004-100, Amoco

Sample Description	Sample Number
Soil Sample B-5-10	9060990

Volatile Organics by Mass Spectrometry

	Detection Limit ug/Kg	Sample Results ug/Kg
Tetrachloroethene	500	8000
1,1,1-Trichloroethane	500	N.D.
Trichloroethene	500	44000
1,1-Dichloroethane	500	N.D.
1,2-Dichloroethane	500	N.D.
1,1-Dichloroethene	500	N.D.
trans-1,2 Dichloroethene	500	N.D.
Methylene Chloride	500	N.D.
Chloroform	500	N.D.
Bromodichloromethane	500	N.D.
Dibromochloromethane	500	N.D.
Bromoform	500	N.D.
Bromomethane	500	N.D.
Chloromethane	500	N.D.
Chloroethane	500	N.D.
Vinyl Chloride	500	N.D.
1,2-Dichloropropane	500	N.D.
1,3-Dichloropropenes	500	N.D.
Carbon Tetrachloride	500	N.D.
Trichlorofluoromethane	2500	N.D.
1,1,2-Trichloroethane	500	N.D.
1,1,2,2-Tetrachloroethane	500	N.D.
2-Chloroethylvinyl ether	500	N.D.

N.D. = None Detected above stated Detection Limit

Del Mar Analytical

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Method of Analysis: EPA 8240

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Date Analyzed: 07/10/89
Date Reported: 07/11/89

Attention: Mark Wood

Project: 0350-004-100, Amoco

Sample Description	Sample Number
B-5-10	9060990

Volatile Organics by Mass Spectrometry

	Detection Limit ug/Kg	Sample Results ug/Kg
Benzene	500	N.D.
Toluene	500	N.D.
Ethylbenzene	500	N.D.
Chlorobenzene	500	N.D.
Xylenes (sum of 3 isomers)	500	N.D.
Acetone	2500	N.D.
2-Butanone	2500	N.D
Carbon Disulfide	1000	N.D.
Vinyl Acetate	1000	N.D.
4-Methyl-2-pentanone	1000	N.D.
2-Hexanone	1000	N.D.
Styrene	1000	N.D.

N.D. = None Detected above stated Detection Limit

Surrogate Recovery:

1,2-Dichloroethane-d4 93 %

Toluene-d8 87 %

4-Bromofluorobenzene 87 %

Del Mar Analytical

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Method of Analysis: EPA 8240

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Date Analyzed: 07/10/89
Date Reported: 07/11/89

Attention: Mark Wood

Project: 0350-004-100, Amoco

Sample Description
Soil Sample B-5-20

Sample Number
9060991

Volatile Organics by Mass Spectrometry

	Detection Limit ug/Kg	Sample Results ug/Kg
Tetrachloroethene	50	N.D.
1,1,1-Trichloroethane	50	N.D.
Trichloroethene	50	N.D.
1,1-Dichloroethane	50	N.D.
1,2-Dichloroethane	50	N.D.
1,1-Dichloroethene	50	N.D.
trans-1,2 Dichloroethene	50	N.D.
Methylene Chloride	50	N.D.
Chloroform	50	N.D.
Bromodichloromethane	50	N.D.
Dibromochloromethane	50	N.D.
Bromoform	50	N.D.
Bromomethane	50	N.D.
Chloromethane	50	N.D.
Chloroethane	50	N.D.
Vinyl Chloride	50	N.D.
1,2-Dichloropropane	50	N.D.
1,3-Dichloropropenes	50	N.D.
Carbon Tetrachloride	50	N.D.
Trichlorofluoromethane	250	N.D.
1,1,2-Trichloroethane	50	N.D.
1,1,2,2-Tetrachloroethane	50	N.D.
2-Chloroethylvinyl ether	50	N.D.

N.D. = None Detected above stated Detection Limit

Del Mar Analytical

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Laboratory Director

Method of Analysis: EPA 8240

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Date Analyzed: 07/10/89
Date Reported: 07/11/89

Attention: Mark Wood

Project: 0350-004-100, Amoco

Sample Description
B-5-20

Sample Number
9060991

Volatile Organics by Mass Spectrometry

	Detection Limit ug/Kg	Sample Results ug/Kg
Benzene	50	N.D.
Toluene	50	N.D.
Ethylbenzene	50	N.D.
Chlorobenzene	50	N.D.
Xylenes (sum of 3 isomers)	50	N.D.
Acetone	250	N.D.
2-Butanone	250	N.D
Carbon Disulfide	100	N.D.
Vinyl Acetate	100	N.D.
4-Methyl-2-pentanone	100	N.D.
2-Hexanone	100	N.D.
Styrene	100	N.D.

N.D. = None Detected above stated Detection Limit

Surrogate Recovery:

1,2-Dichloroethane-d4	95 %
Toluene-d8	87 %
4-Bromofluorobenzene	86 %

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Method of Analysis: EPA 8240

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Date Sampled: 06/28/89
Date Received: 06/28/89
Date Analyzed: 07/10/89
Date Reported: 07/11/89

Attention: Mark Wood

Project: 0350-004-100, Amoco

Sample Description
Soil Sample B-6-15

Sample Number
9060992

Volatile Organics by Mass Spectrometry

	Detection Limit ug/Kg	Sample Results ug/Kg
Tetrachloroethene	50	N.D.
1,1,1-Trichloroethane	50	N.D.
Trichloroethene	50	N.D.
1,1-Dichloroethane	50	N.D.
1,2-Dichloroethane	50	N.D.
1,1-Dichloroethene	50	N.D.
trans-1,2 Dichloroethene	50	N.D.
Methylene Chloride	50	N.D.
Chloroform	50	N.D.
Bromodichloromethane	50	N.D.
Dibromochloromethane	50	N.D.
Bromoform	50	N.D.
Bromomethane	50	N.D.
Chloromethane	50	N.D.
Chloroethane	50	N.D.
Vinyl Chloride	50	N.D.
1,2-Dichloropropane	50	N.D.
1,3-Dichloropropenes	50	N.D.
Carbon Tetrachloride	50	N.D.
Trichlorofluoromethane	250	N.D.
1,1,2-Trichloroethane	50	N.D.
1,1,2,2-Tetrachloroethane	50	N.D.
2-Chloroethylvinyl ether	50	N.D.

N.D. = None Detected above stated Detection Limit

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Method of Analysis: EPA 8240

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ENSR Constructors
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Date Sampled: 06/28/89
Date Received: 06/28/89
Date Analyzed: 07/10/89
Date Reported: 07/11/89

Attention: Mark Wood

Project: 0350-004-100, Amoco

Sample Description	Sample Number
B-6-15	9060992

Volatile Organics by Mass Spectrometry

	Detection Limit ug/Kg	Sample Results ug/Kg
Benzene	50	N.D.
Toluene	50	N.D.
Ethylbenzene	50	N.D.
Chlorobenzene	50	N.D.
Xylenes (sum of 3 isomers)	50	N.D.
Acetone	250	N.D.
2-Butanone	250	N.D.
Carbon Disulfide	100	N.D
Vinyl Acetate	100	N.D.
4-Methyl-2-pentanone	100	N.D.
2-Hexanone	100	N.D.
Styrene	100	N.D.

N.D. = None Detected above stated Detection Limit

Surrogate Recovery:

1,2-Dichloroethane-d4	91 %
Toluene-d8	86 %
4-Bromofluorobenzene	89 %

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Date Reported: 07/11/89

Attention: Mark Wood

Project: 0350-004-100, Amoco

Sample Description	Sample Number
Soil Sample B-6-20	9060993

Volatile Organics by Mass Spectrometry

	Detection Limit ug/Kg	Sample Results ug/Kg
Tetrachloroethene	50	N.D.
1,1,1-Trichloroethane	50	N.D.
Trichloroethene	50	N.D.
1,1-Dichloroethane	50	N.D.
1,2-Dichloroethane	50	N.D.
1,1-Dichloroethene	50	N.D.
trans-1,2 Dichloroethene	50	N.D.
Methylene Chloride	50	N.D.
Chloroform	50	N.D.
Bromodichloromethane	50	N.D.
Dibromochloromethane	50	N.D.
Bromoform	50	N.D.
Bromomethane	50	N.D.
Chloromethane	50	N.D.
Chloroethane	50	N.D.
Vinyl Chloride	50	N.D.
1,2-Dichloropropane	50	N.D.
1,3-Dichloropropenes	50	N.D.
Carbon Tetrachloride	50	N.D.
Trichlorofluoromethane	250	N.D.
1,1,2-Trichloroethane	50	N.D.
1,1,2,2-Tetrachloroethane	50	N.D.
2-Chloroethylvinyl ether	50	N.D.

N.D. = None Detected above stated Detection Limit

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Date Analyzed: 07/10/89
Date Reported: 07/11/89

Attention: Mark Wood

Project: 0350-004-100, Amoco

Sample Description	Sample Number
B-6-20	9060993

Volatile Organics by Mass Spectrometry

	Detection Limit ug/Kg	Sample Results ug/Kg
Benzene	50	N.D.
Toluene	50	N.D.
Ethylbenzene	50	N.D.
Chlorobenzene	50	N.D.
Xylenes (sum of 3 isomers)	50	N.D.
Acetone	250	N.D.
2-Butanone	250	N.D
Carbon Disulfide	100	N.D.
Vinyl Acetate	100	N.D.
4-Methyl-2-pentanone	100	N.D.
2-Hexanone	100	N.D.
Styrene	100	N.D.

N.D. = None Detected above stated Detection Limit

Surrogate Recovery:

1,2-Dichloroethane-d4	96 %
Toluene-d8	85 %
4-Bromofluorobenzene	83 %

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Date Reported: 07/11/89

Attention: Mark Wood

Project: 0350-004-100, Amoco

Sample Description
Soil Sample B-7-10

Sample Number
9060994

Volatile Organics by Mass Spectrometry

	Detection Limit ug/Kg	Sample Results ug/Kg
Tetrachloroethene	50	N.D.
1,1,1-Trichloroethane	50	N.D.
Trichloroethene	50	N.D.
1,1-Dichloroethane	50	N.D.
1,2-Dichloroethane	50	N.D.
1,1-Dichloroethene	50	N.D.
trans-1,2 Dichloroethene	50	N.D.
Methylene Chloride	50	N.D.
Chloroform	50	N.D.
Bromodichloromethane	50	N.D.
Dibromochloromethane	50	N.D.
Bromoform	50	N.D.
Bromomethane	50	N.D.
Chloromethane	50	N.D.
Chloroethane	50	N.D.
Vinyl Chloride	50	N.D.
1,2-Dichloropropane	50	N.D.
1,3-Dichloropropenes	50	N.D.
Carbon Tetrachloride	50	N.D.
Trichlorofluoromethane	250	N.D.
1,1,2-Trichloroethane	50	N.D.
1,1,2,2-Tetrachloroethane	50	N.D.
2-Chloroethylvinyl ether	50	N.D.

N.D. = None Detected above stated Detection Limit

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Method of Analysis: EPA 8240

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Date Received: 06/28/89
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Date Reported: 07/11/89

Attention: Mark Wood

Project: 0350-004-100, Amoco

Sample Description	Sample Number
B-7-10	9060948

Volatile Organics by Mass Spectrometry

	Detection Limit ug/Kg	Sample Results ug/Kg
Benzene	50	N.D.
Toluene	50	N.D.
Ethylbenzene	50	N.D.
Chlorobenzene	50	N.D.
Xylenes (sum of 3 isomers)	50	N.D.
Acetone	250	N.D.
2-Butanone	250	N.D
Carbon Disulfide	100	N.D.
Vinyl Acetate	100	N.D.
4-Methyl-2-pentanone	100	N.D.
2-Hexanone	100	N.D.
Styrene	100	N.D.

N.D. = None Detected above stated Detection Limit

Surrogate Recovery:

1,2-Dichloroethane-d4	96 %
Toluene-d8	85 %
4-Bromofluorobenzene	83 %

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Method of Analysis: EPA 8240

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Date Analyzed: 07/10/89
Date Reported: 07/11/89

Attention: Mark Wood

Project: 0350-004-100, Amoco

Sample Description
Soil Sample B-7-15

Sample Number
9060995

Volatile Organics by Mass Spectrometry

	Detection Limit ug/Kg	Sample Results ug/Kg
Tetrachloroethene	50	N.D.
1,1,1-Trichloroethane	50	N.D.
Trichloroethene	50	N.D.
1,1-Dichloroethane	50	N.D.
1,2-Dichloroethane	50	N.D.
1,1-Dichloroethene	50	N.D.
trans-1,2 Dichloroethene	50	N.D.
Methylene Chloride	50	N.D.
Chloroform	50	N.D.
Bromodichloromethane	50	N.D.
Dibromochloromethane	50	N.D.
Bromoform	50	N.D.
Bromomethane	50	N.D.
Chloromethane	50	N.D.
Chloroethane	50	N.D.
Vinyl Chloride	50	N.D.
1,2-Dichloropropane	50	N.D.
1,3-Dichloropropenes	50	N.D.
Carbon Tetrachloride	50	N.D.
Trichlorofluoromethane	250	N.D.
1,1,2-Trichloroethane	50	N.D.
1,1,2,2-Tetrachloroethane	50	N.D.
2-Chloroethylvinyl ether	50	N.D.

N.D. = None Detected above stated Detection Limit

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Date Sampled: 06/28/89
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Date Reported: 07/11/89

Attention: Mark Wood

Project: 0350-004-100, Amoco

Sample Description	Sample Number
B-7-15	9060995

Volatile Organics by Mass Spectrometry

	Detection Limit ug/Kg	Sample Results ug/Kg
Benzene	50	N.D.
Toluene	50	N.D.
Ethylbenzene	50	N.D.
Chlorobenzene	50	N.D.
Xylenes (sum of 3 isomers)	50	N.D.
Acetone	250	N.D.
2-Butanone	250	N.D
Carbon Disulfide	100	N.D.
Vinyl Acetate	100	N.D.
4-Methyl-2-pentanone	100	N.D.
2-Hexanone	100	N.D.
Styrene	100	N.D.

N.D. = None Detected above stated Detection Limit

Surrogate Recovery:

1,2-Dichloroethane-d4	93 %
Toluene-d8	85 %
4-Bromofluorobenzene	86 %

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Date Sampled: 06/29/89
Date Received: 06/30/89
Date Analyzed: 07/12/89
Date Reported: 07/13/89

Attention: Mark Wood

Project: 0350-004-100, Amoco

Sample Description
Soil Sample B-8-15

Sample Number
9061028

Volatile Organics by Mass Spectrometry

	Detection Limit ug/Kg	Sample Results ug/Kg
Tetrachloroethene	50	N.D.
1,1,1-Trichloroethane	50	N.D.
Trichloroethene	50	N.D.
1,1-Dichloroethane	50	N.D.
1,2-Dichloroethane	50	N.D.
1,1-Dichloroethene	50	N.D.
trans-1,2 Dichloroethene	50	N.D.
Methylene Chloride	50	N.D.
Chloroform	50	N.D.
Bromodichloromethane	50	N.D.
Dibromochloromethane	50	N.D.
Bromoform	50	N.D.
Bromomethane	50	N.D.
Chloromethane	50	N.D.
Chloroethane	50	N.D.
Vinyl Chloride	50	N.D.
1,2-Dichloropropane	50	N.D.
1,3-Dichloropropenes	50	N.D.
Carbon Tetrachloride	50	N.D.
Trichlorofluoromethane	250	N.D.
1,1,2-Trichloroethane	50	N.D.
1,1,2,2-Tetrachloroethane	50	N.D.
2-Chloroethylvinyl ether	50	N.D.

N.D. = None Detected above stated Detection Limit

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Method of Analysis: EPA 8240

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Date Reported: 07/13/89

Attention: Mark Wood

Project: 0350-004-100, Amoco

Sample Description
B-8-15

Sample Number
9061028

Volatile Organics by Mass Spectrometry

	Detection Limit ug/Kg	Sample Results ug/Kg
Benzene	50	N.D.
Toluene	50	N.D.
Ethylbenzene	50	N.D.
Chlorobenzene	50	N.D.
Xylenes (sum of 3 isomers)	50	N.D.
Acetone	250	N.D.
2-Butanone	250	N.D
Carbon Disulfide	100	N.D.
Vinyl Acetate	100	N.D.
4-Methyl-2-pentanone	100	N.D.
2-Hexanone	100	N.D.
Styrene	100	N.D.

N.D. = None Detected above stated Detection Limit

Surrogate Recovery:

1,2-Dichloroethane-d4	89 %
Toluene-d8	103 %
4-Bromofluorobenzene	103 %

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Date Received: 06/30/89
Date Analyzed: 07/12/89
Date Reported: 07/13/89

Attention: Mark Wood

Project: 0350-004-100, Amoco

Sample Description	Sample Number
Soil Sample B-8-20	9061029

Volatile Organics by Mass Spectrometry

	Detection Limit ug/Kg	Sample Results ug/Kg
Tetrachloroethene	50	N.D.
1,1,1-Trichloroethane	50	N.D.
Trichloroethene	50	N.D.
1,1-Dichloroethane	50	N.D.
1,2-Dichloroethane	50	N.D.
1,1-Dichloroethene	50	N.D.
trans-1,2 Dichloroethene	50	N.D.
Methylene Chloride	50	N.D.
Chloroform	50	N.D.
Bromodichloromethane	50	N.D.
Dibromochloromethane	50	N.D.
Bromoform	50	N.D.
Bromomethane	50	N.D.
Chloromethane	50	N.D.
Chloroethane	50	N.D.
Vinyl Chloride	50	N.D.
1,2-Dichloropropane	50	N.D.
1,3-Dichloropropenes	50	N.D.
Carbon Tetrachloride	50	N.D.
Trichlorofluoromethane	250	N.D.
1,1,2-Trichloroethane	50	N.D.
1,1,2,2-Tetrachloroethane	50	N.D.
2-Chloroethylvinyl ether	50	N.D.

N.D. = None Detected above stated Detection Limit

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Date Reported: 07/13/89

Attention: Mark Wood

Project: 0350-004-100, Amoco

Sample Description
B-8-20

Sample Number
9061029

Volatile Organics by Mass Spectrometry

	Detection Limit ug/Kg	Sample Results ug/Kg
Benzene	50	N.D.
Toluene	50	N.D.
Ethylbenzene	50	N.D.
Chlorobenzene	50	N.D.
Xylenes (sum of 3 isomers)	50	N.D.
Acetone	250	N.D.
2-Butanone	250	N.D
Carbon Disulfide	100	N.D.
Vinyl Acetate	100	N.D.
4-Methyl-2-pentanone	100	N.D.
2-Hexanone	100	N.D.
Styrene	100	N.D.

N.D. = None Detected above stated Detection Limit

Surrogate Recovery:

1,2-Dichloroethane-d4	85 %
Toluene-d8	97 %
4-Bromofluorobenzene	104 %

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Method of Analysis: EPA 8240

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Date Analyzed: 07/12/89
Date Reported: 07/13/89

Attention: Mark Wood

Project: 0350-004-100, Amoco

Sample Description	Sample Number
Soil Sample B-9-15	9061030

Volatile Organics by Mass Spectrometry

	Detection Limit ug/Kg	Sample Results ug/Kg
Tetrachloroethene	50	N.D.
1,1,1-Trichloroethane	50	N.D.
Trichloroethene	50	N.D.
1,1-Dichloroethane	50	N.D.
1,2-Dichloroethane	50	N.D.
1,1-Dichloroethene	50	N.D.
trans-1,2 Dichloroethene	50	N.D.
Methylene Chloride	50	N.D.
Chloroform	50	N.D.
Bromodichloromethane	50	N.D.
Dibromochloromethane	50	N.D.
Bromoform	50	N.D.
Bromomethane	50	N.D.
Chloromethane	50	N.D.
Chloroethane	50	N.D.
Vinyl Chloride	50	N.D.
1,2-Dichloropropane	50	N.D.
1,3-Dichloropropenes	50	N.D.
Carbon Tetrachloride	50	N.D.
Trichlorofluoromethane	250	N.D.
1,1,2-Trichloroethane	50	N.D.
1,1,2,2-Tetrachloroethane	50	N.D.
2-Chloroethylvinyl ether	50	N.D.

N.D. = None Detected above stated Detection Limit

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Method of Analysis: EPA 8240

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Date Analyzed: 07/12/89
Date Reported: 07/13/89

Attention: Mark Wood

Project: 0350-004-100, Amoco

Sample Description	Sample Number
B-9-15	9061030

Volatile Organics by Mass Spectrometry

	Detection Limit ug/Kg	Sample Results ug/Kg
Benzene	50	N.D.
Toluene	50	N.D.
Ethylbenzene	50	700
Chlorobenzene	50	N.D.
Xylenes (sum of 3 isomers)	50	N.D.
Acetone	250	N.D.
2-Butanone	250	N.D
Carbon Disulfide	100	N.D.
Vinyl Acetate	100	N.D.
4-Methyl-2-pentanone	100	N.D.
2-Hexanone	100	N.D.
Styrene	100	1200

N.D. = None Detected above stated Detection Limit

Surrogate Recovery:

1,2-Dichloroethane-d4	87 %
Toluene-d8	100 %
4-Bromofluorobenzene	110 %

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Date Received: 06/30/89
Date Analyzed: 07/12/89
Date Reported: 07/13/89

Attention: Mark Wood

Project: 0350-004-100, Amoco

Sample Description
Soil Sample B-9-20

Sample Number
9061031

Volatile Organics by Mass Spectrometry

	Detection Limit ug/Kg	Sample Results ug/Kg
Tetrachloroethene	50	N.D.
1,1,1-Trichloroethane	50	N.D.
Trichloroethene	50	N.D.
1,1-Dichloroethane	50	N.D.
1,2-Dichloroethane	50	N.D.
1,1-Dichloroethene	50	N.D.
trans-1,2 Dichloroethene	50	N.D.
Methylene Chloride	50	N.D.
Chloroform	50	N.D.
Bromodichloromethane	50	N.D.
Dibromochloromethane	50	N.D.
Bromoform	50	N.D.
Bromomethane	50	N.D.
Chloromethane	50	N.D.
Chloroethane	50	N.D.
Vinyl Chloride	50	N.D.
1,2-Dichloropropane	50	N.D.
1,3-Dichloropropenes	50	N.D.
Carbon Tetrachloride	50	N.D.
Trichlorofluoromethane	250	N.D.
1,1,2-Trichloroethane	50	N.D.
1,1,2,2-Tetrachloroethane	50	N.D.
2-Chloroethylvinyl ether	50	N.D.

N.D. = None Detected above stated Detection Limit

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Method of Analysis: EPA 8240

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Date Analyzed: 07/12/89
Date Reported: 07/13/89

Attention: Mark Wood

Project: 0350-004-100, Amoco

Sample Description	Sample Number
B-9-20	9061031

Volatile Organics by Mass Spectrometry

	Detection Limit ug/Kg	Sample Results ug/Kg
Benzene	50	N.D.
Toluene	50	N.D.
Ethylbenzene	50	950
Chlorobenzene	50	N.D.
Xylenes (sum of 3 isomers)	50	N.D.
Acetone	250	N.D.
2-Butanone	250	N.D
Carbon Disulfide	100	N.D.
Vinyl Acetate	100	N.D.
4-Methyl-2-pentanone	100	N.D.
2-Hexanone	100	N.D.
Styrene	100	4400

N.D. = None Detected above stated Detection Limit

Surrogate Recovery:

1,2-Dichloroethane-d4	86 %
Toluene-d8	105 %
4-Bromofluorobenzene	105 %

Del Mar Analytical

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Method of Analysis: EPA 8240

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Date Sampled: 06/29/89
Date Received: 06/30/89
Date Analyzed: 07/12/89
Date Reported: 07/13/89

Attention: Mark Wood

Project: 0350-004-100, Amoco

Sample Description
Soil Sample B-10-15

Sample Number
9061032

Volatile Organics by Mass Spectrometry

	Detection Limit ug/Kg	Sample Results ug/Kg
Tetrachloroethene	50	N.D.
1,1,1-Trichloroethane	50	N.D.
Trichloroethene	50	N.D.
1,1-Dichloroethane	50	N.D.
1,2-Dichloroethane	50	N.D.
1,1-Dichloroethene	50	N.D.
trans-1,2 Dichloroethene	50	N.D.
Methylene Chloride	50	N.D.
Chloroform	50	N.D.
Bromodichloromethane	50	N.D.
Dibromochloromethane	50	N.D.
Bromoform	50	N.D.
Bromomethane	50	N.D.
Chloromethane	50	N.D.
Chloroethane	50	N.D.
Vinyl Chloride	50	N.D.
1,2-Dichloropropane	50	N.D.
1,3-Dichloropropenes	50	N.D.
Carbon Tetrachloride	50	N.D.
Trichlorofluoromethane	250	N.D.
1,1,2-Trichloroethane	50	N.D.
1,1,2,2-Tetrachloroethane	50	N.D.
2-Chloroethylvinyl ether	50	N.D.

N.D. = None Detected above stated Detection Limit

Del Mar Analytical

Method of Analysis: EPA 8240

G. Steube
Gary Steube
Laboratory Director

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Date Sampled: 06/29/89
Date Received: 06/30/89
Date Analyzed: 07/12/89
Date Reported: 07/13/89

Attention: Mark Wood

Project: 0350-004-100, Amoco

Sample Description: B-10-15

Sample Number: 9061032

Volatile Organics by Mass Spectrometry

	Detection Limit ug/Kg	Sample Results ug/Kg
Benzene	50	N.D.
Toluene	50	N.D.
Ethylbenzene	50	N.D.
Chlorobenzene	50	N.D.
Xylenes (sum of 3 isomers)	50	N.D.
Acetone	250	N.D.
2-Butanone	250	N.D
Carbon Disulfide	100	N.D.
Vinyl Acetate	100	N.D.
4-Methyl-2-pentanone	100	N.D.
2-Hexanone	100	N.D.
Styrene	100	N.D.

N.D. = None Detected above stated Detection Limit

Surrogate Recovery:

1,2-Dichloroethane-d4	86 %
Toluene-d8	97 %
4-Bromofluorobenzene	105 %

Del Mar Analytical

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Laboratory Director

Method of Analysis: EPA 8240

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Date Analyzed: 07/12/89
Date Reported: 07/13/89

Attention: Mark Wood

Project: 0350-004-100, Amoco

Sample Description	Sample Number
Soil Sample B-10-20	9061033

Volatile Organics by Mass Spectrometry

	Detection Limit ug/Kg	Sample Results ug/Kg
Tetrachloroethene	50	N.D.
1,1,1-Trichloroethane	50	N.D.
Trichloroethene	50	N.D.
1,1-Dichloroethane	50	N.D.
1,2-Dichloroethane	50	N.D.
1,1-Dichloroethene	50	N.D.
trans-1,2 Dichloroethene	50	N.D.
Methylene Chloride	50	N.D.
Chloroform	50	N.D.
Bromodichloromethane	50	N.D.
Dibromochloromethane	50	N.D.
Bromoform	50	N.D.
Bromomethane	50	N.D.
Chloromethane	50	N.D.
Chloroethane	50	N.D.
Vinyl Chloride	50	N.D.
1,2-Dichloropropane	50	N.D.
1,3-Dichloropropenes	50	N.D.
Carbon Tetrachloride	50	N.D.
Trichlorofluoromethane	250	N.D.
1,1,2-Trichloroethane	50	N.D.
1,1,2,2-Tetrachloroethane	50	N.D.
2-Chloroethylvinyl ether	50	N.D.

N.D. = None Detected above stated Detection Limit

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Date Reported: 07/13/89

Attention: Mark Wood

Project: 0350-004-100, Amoco

Sample Description
B-10-20

Sample Number
9061033

Volatile Organics by Mass Spectrometry

	Detection Limit ug/Kg	Sample Results ug/Kg
Benzene	50	N.D.
Toluene	50	N.D.
Ethylbenzene	50	N.D.
Chlorobenzene	50	N.D.
Xylenes (sum of 3 isomers)	50	N.D.
Acetone	250	N.D.
2-Butanone	250	N.D
Carbon Disulfide	100	N.D.
Vinyl Acetate	100	N.D.
4-Methyl-2-pentanone	100	N.D.
2-Hexanone	100	N.D.
Styrene	100	N.D.

N.D. = None Detected above stated Detection Limit

Surrogate Recovery:

1,2-Dichloroethane-d4	88 %
Toluene-d8	98 %
4-Bromofluorobenzene	106 %

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Attention: Mark Wood

Project: 0350-004-100, Amoco

Sample Description
Soil Sample B-11-10

Sample Number
9061034

Volatile Organics by Mass Spectrometry

	Detection Limit ug/Kg	Sample Results ug/Kg
Tetrachloroethene	50	80
1,1,1-Trichloroethane	50	N.D.
Trichloroethene	50	90
1,1-Dichloroethane	50	N.D.
1,2-Dichloroethane	50	N.D.
1,1-Dichloroethene	50	N.D.
trans-1,2 Dichloroethene	50	N.D.
Methylene Chloride	50	N.D.
Chloroform	50	N.D.
Bromodichloromethane	50	N.D.
Dibromochloromethane	50	N.D.
Bromoform	50	N.D.
Bromomethane	50	N.D.
Chloromethane	50	N.D.
Chloroethane	50	N.D.
Vinyl Chloride	50	N.D.
1,2-Dichloropropane	50	N.D.
1,3-Dichloropropenes	50	N.D.
Carbon Tetrachloride	50	N.D.
Trichlorofluoromethane	250	N.D.
1,1,2-Trichloroethane	50	N.D.
1,1,2,2-Tetrachloroethane	50	N.D.
2-Chloroethylvinyl ether	50	N.D.

N.D. = None Detected above stated Detection Limit

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Method of Analysis: EPA 8240

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Date Reported: 07/13/89

Attention: Mark Wood

Project: 0350-004-100, Amoco

Sample Description
B-11-10

Sample Number
9061034

Volatile Organics by Mass Spectrometry

	Detection Limit ug/Kg	Sample Results ug/Kg
Benzene	50	N.D.
Toluene	50	N.D.
Ethylbenzene	50	N.D.
Chlorobenzene	50	N.D.
Xylenes (sum of 3 isomers)	50	N.D.
Acetone	250	N.D.
2-Butanone	250	N.D
Carbon Disulfide	100	N.D.
Vinyl Acetate	100	N.D.
4-Methyl-2-pentanone	100	N.D.
2-Hexanone	100	N.D.
Styrene	100	N.D.

N.D. = None Detected above stated Detection Limit

Surrogate Recovery:

1,2-Dichloroethane-d4	85 %
Toluene-d8	92 %
4-Bromofluorobenzene	105 %

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Date Received: 06/30/89
Date Analyzed: 07/12/89
Date Reported: 07/13/89

Attention: Mark Wood

Project: 0350-004-100, Amoco

Sample Description	Sample Number
Soil Sample B-11-15	9061035

Volatile Organics by Mass Spectrometry

	Detection Limit ug/Kg	Sample Results ug/Kg
Tetrachloroethene	50	N.D.
1,1,1-Trichloroethane	50	N.D.
Trichloroethene	50	N.D.
1,1-Dichloroethane	50	N.D.
1,2-Dichloroethane	50	N.D.
1,1-Dichloroethene	50	N.D.
trans-1,2 Dichloroethene	50	N.D.
Methylene Chloride	50	N.D.
Chloroform	50	N.D.
Bromodichloromethane	50	N.D.
Dibromochloromethane	50	N.D.
Bromoform	50	N.D.
Bromomethane	50	N.D.
Chloromethane	50	N.D.
Chloroethane	50	N.D.
Vinyl Chloride	50	N.D.
1,2-Dichloropropane	50	N.D.
1,3-Dichloropropenes	50	N.D.
Carbon Tetrachloride	50	N.D.
Trichlorofluoromethane	250	N.D.
1,1,2-Trichloroethane	50	N.D.
1,1,2,2-Tetrachloroethane	50	N.D.
2-Chloroethylvinyl ether	50	N.D.

N.D. = None Detected above stated Detection Limit

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Method of Analysis: EPA 8240

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Date Analyzed: 07/12/89
Date Reported: 07/13/89

Attention: Mark Wood

Project: 0350-004-100, Amoco

Sample Description	Sample Number
B-11-15	9061035

Volatile Organics by Mass Spectrometry

	Detection Limit ug/Kg	Sample Results ug/Kg
Benzene	50	N.D.
Toluene	50	N.D.
Ethylbenzene	50	N.D.
Chlorobenzene	50	N.D.
Xylenes (sum of 3 isomers)	50	N.D.
Acetone	250	N.D.
2-Butanone	250	N.D
Carbon Disulfide	100	N.D.
Vinyl Acetate	100	N.D.
4-Methyl-2-pentanone	100	N.D.
2-Hexanone	100	N.D.
Styrene	100	N.D.

N.D. = None Detected above stated Detection Limit

Surrogate Recovery:

1,2-Dichloroethane-d4	86 %
Toluene-d8	94 %
4-Bromofluorobenzene	108 %

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Date Sampled: 06/30/89
Date Received: 06/30/89
Date Analyzed: 07/13/89
Date Reported: 07/14/89

Attention: Bill Leever

Project: 0350-004-100, Amoco

Sample Description: Soil Sample B-12-15

Sample Number: 9061078

Volatile Organics by Mass Spectrometry

	Detection Limit ug/Kg	Sample Results ug/Kg
Tetrachloroethene	50	N.D.
1,1,1-Trichloroethane	50	N.D.
Trichloroethene	50	N.D.
1,1-Dichloroethane	50	N.D.
1,2-Dichloroethane	50	N.D.
1,1-Dichloroethene	50	N.D.
trans-1,2 Dichloroethene	50	N.D.
Methylene Chloride	50	N.D.
Chloroform	50	N.D.
Bromodichloromethane	50	N.D.
Dibromochloromethane	50	N.D.
Bromoform	50	N.D.
Bromomethane	50	N.D.
Chloromethane	50	N.D.
Chloroethane	50	N.D.
Vinyl Chloride	50	N.D.
1,2-Dichloropropane	50	N.D.
1,3-Dichloropropenes	50	N.D.
Carbon Tetrachloride	50	N.D.
Trichlorofluoromethane	250	N.D.
1,1,2-Trichloroethane	50	N.D.
1,1,2,2-Tetrachloroethane	50	N.D.
2-Chloroethylvinyl ether	50	N.D.

N.D. = None Detected above stated Detection Limit

Del Mar Analytical
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Method of Analysis: EPA 8240

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Date Reported: 07/14/89

Attention: Bill Leever

Project: 0350-004-100, Amoco

Sample Description: Soil Sample B-12-15

Sample Number: 9071078

Volatile Organics by Mass Spectrometry

	Detection Limit ug/Kg	Sample Results ug/Kg
Benzene	50	N.D.
Toluene	50	N.D.
Ethylbenzene	50	N.D.
Chlorobenzene	50	N.D.
Xylenes (sum of 3 isomers)	50	N.D.
Acetone	250	N.D.
2-Butanone	250	N.D
Carbon Disulfide	100	N.D.
Vinyl Acetate	100	N.D.
4-Methyl-2-pentanone	100	N.D.
2-Hexanone	100	N.D.
Styrene	100	N.D.

N.D. = None Detected above stated Detection Limit

Surrogate Recovery:

1,2-Dichloroethane-d4	88 %
Toluene-d8	94 %
4-Bromofluorobenzene	104 %

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Attention: Bill Leever

Project: 0350-004-100, Amoco

<u>Sample Description</u>
Soil Sample B-12-20

<u>Sample Number</u>
9061079

Volatile Organics by Mass Spectrometry

	Detection Limit ug/Kg	Sample Results ug/Kg
Tetrachloroethene	50	N.D.
1,1,1-Trichloroethane	50	N.D.
Trichloroethene	50	N.D.
1,1-Dichloroethane	50	N.D.
1,2-Dichloroethane	50	N.D.
1,1-Dichloroethene	50	N.D.
trans-1,2 Dichloroethene	50	N.D.
Methylene Chloride	50	N.D.
Chloroform	50	N.D.
Bromodichloromethane	50	N.D.
Dibromochloromethane	50	N.D.
Bromoform	50	N.D.
Bromomethane	50	N.D.
Chloromethane	50	N.D.
Chloroethane	50	N.D.
Vinyl Chloride	50	N.D.
1,2-Dichloropropane	50	N.D.
1,3-Dichloropropenes	50	N.D.
Carbon Tetrachloride	50	N.D.
Trichlorofluoromethane	250	N.D.
1,1,2-Trichloroethane	50	N.D.
1,1,2,2-Tetrachloroethane	50	N.D.
2-Chloroethylvinyl ether	50	N.D.

N.D. = None Detected above stated Detection Limit

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Method of Analysis: EPA 8240

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Attention: Bill Leever

Project: 0350-004-100, Amoco

Sample Description
Soil Sample B-12-20

Sample Number
9071079

Volatile Organics by Mass Spectrometry

	Detection Limit ug/Kg	Sample Results ug/Kg
Benzene	50	N.D.
Toluene	50	N.D.
Ethylbenzene	50	N.D.
Chlorobenzene	50	N.D.
Xylenes (sum of 3 isomers)	50	N.D.
Acetone	250	N.D.
2-Butanone	250	N.D
Carbon Disulfide	100	N.D.
Vinyl Acetate	100	N.D.
4-Methyl-2-pentanone	100	N.D.
2-Hexanone	100	N.D.
Styrene	100	N.D.

N.D. = None Detected above stated Detection Limit

Surrogate Recovery:

1,2-Dichloroethane-d4	88 %
Toluene-d8	90 %
4-Bromofluorobenzene	105 %

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Method of Analysis: EPA 8240

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Attention: Bill Leever

Project: 0350-004-100, Amoco

Sample Description
Soil Sample B-13-15

Sample Number
9061080

Volatile Organics by Mass Spectrometry

	Detection Limit ug/Kg	Sample Results ug/Kg
Tetrachloroethene	1000	2400
1,1,1-Trichloroethane	1000	N.D.
Trichloroethene	1000	46000
1,1-Dichloroethane	1000	N.D.
1,2-Dichloroethane	1000	N.D.
1,1-Dichloroethene	1000	N.D.
trans-1,2 Dichloroethene	1000	N.D.
Methylene Chloride	1000	N.D.
Chloroform	1000	N.D.
Bromodichloromethane	1000	N.D.
Dibromochloromethane	1000	N.D.
Bromoform	1000	N.D.
Bromomethane	1000	N.D.
Chloromethane	1000	N.D.
Chloroethane	1000	N.D.
Vinyl Chloride	1000	N.D.
1,2-Dichloropropane	1000	N.D.
1,3-Dichloropropenes	1000	N.D.
Carbon Tetrachloride	1000	N.D.
Trichlorofluoromethane	5000	N.D.
1,1,2-Trichloroethane	1000	N.D.
1,1,2,2-Tetrachloroethane	1000	N.D.
2-Chloroethylvinyl ether	1000	N.D.

N.D. = None Detected above stated Detection Limit

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Method of Analysis: EPA 8240

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Date Reported: 07/14/89

Attention: Bill Leever

Project: 0350-004-100, Amoco

<u>Sample Description</u>
Soil Sample B-13-15

<u>Sample Number</u>
9071080

Volatile Organics by Mass Spectrometry

	Detection Limit ug/Kg	Sample Results ug/Kg
Benzene	1000	N.D.
Toluene	1000	1100
Ethylbenzene	1000	65000
Chlorobenzene	1000	N.D.
Xylenes (sum of 3 isomers)	1000	N.D.
Acetone	5000	N.D.
2-Butanone	5000	N.D
Carbon Disulfide	2000	N.D.
Vinyl Acetate	2000	N.D.
4-Methyl-2-pentanone	2000	N.D.
2-Hexanone	2000	N.D.
Styrene	2000	330000

N.D. = None Detected above stated Detection Limit

Surrogate Recovery:

1,2-Dichloroethane-d4	85 %
Toluene-d8	84 %
4-Bromofluorobenzene	109 %

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Method of Analysis: EPA 8240

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Date Analyzed: 07/14/89
Date Reported: 07/14/89

Attention: Bill Leever

Project: 0350-004-100, Amoco

Sample Description	Sample Number
Soil Sample B-13-20	9061081

Volatile Organics by Mass Spectrometry

	Detection Limit ug/Kg	Sample Results ug/Kg
Tetrachloroethene	1000	1400
1,1,1-Trichloroethane	1000	N.D.
Trichloroethene	1000	6800
1,1-Dichloroethane	1000	N.D.
1,2-Dichloroethane	1000	N.D.
1,1-Dichloroethene	1000	N.D.
trans-1,2 Dichloroethene	1000	N.D.
Methylene Chloride	1000	N.D.
Chloroform	1000	N.D.
Bromodichloromethane	1000	N.D.
Dibromochloromethane	1000	N.D.
Bromoform	1000	N.D.
Bromomethane	1000	N.D.
Chloromethane	1000	N.D.
Chloroethane	1000	N.D.
Vinyl Chloride	1000	N.D.
1,2-Dichloropropane	1000	N.D.
1,3-Dichloropropenes	1000	N.D.
Carbon Tetrachloride	1000	N.D.
Trichlorofluoromethane	5000	N.D.
1,1,2-Trichloroethane	1000	N.D.
1,1,2,2-Tetrachloroethane	1000	N.D.
2-Chloroethylvinyl ether	1000	N.D.

N.D. = None Detected above stated Detection Limit

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Method of Analysis: EPA 8240

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Date Received: 06/30/89
Date Analyzed: 07/14/89
Date Reported: 07/14/89

Attention: Bill Leever

Project: 0350-004-100, Amoco

Sample Description	Sample Number
Soil Sample B-13-20	9071081

Volatile Organics by Mass Spectrometry

	Detection Limit ug/Kg	Sample Results ug/Kg
Benzene	1000	N.D.
Toluene	1000	N.D.
Ethylbenzene	1000	20000
Chlorobenzene	1000	N.D.
Xylenes (sum of 3 isomers)	1000	N.D.
Acetone	5000	N.D.
2-Butanone	5000	N.D
Carbon Disulfide	2000	N.D.
Vinyl Acetate	2000	N.D.
4-Methyl-2-pentanone	2000	N.D.
2-Hexanone	2000	N.D.
Styrene	2000	100000

N.D. = None Detected above stated Detection Limit

Surrogate Recovery:

1,2-Dichloroethane-d4	86 %
Toluene-d8	102 %
4-Bromofluorobenzene	105 %

Del Mar Analytical

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Method of Analysis: EPA 8240

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Date Sampled: 06/30/89
Date Received: 06/30/89
Date Analyzed: 07/14/89
Date Reported: 07/14/89

Attention: Bill Leever

Project: 0350-004-100, Amoco

Sample Description
Soil Sample B-14-15

Sample Number
9061082

Volatile Organics by Mass Spectrometry

	Detection Limit ug/Kg	Sample Results ug/Kg
Tetrachloroethene	50	75
1,1,1-Trichloroethane	50	N.D.
Trichloroethene	50	290
1,1-Dichloroethane	50	N.D.
1,2-Dichloroethane	50	N.D.
1,1-Dichloroethene	50	N.D.
trans-1,2 Dichloroethene	50	N.D.
Methylene Chloride	50	N.D.
Chloroform	50	N.D.
Bromodichloromethane	50	N.D.
Dibromochloromethane	50	N.D.
Bromoform	50	N.D.
Bromomethane	50	N.D.
Chloromethane	50	N.D.
Chloroethane	50	N.D.
Vinyl Chloride	50	N.D.
1,2-Dichloropropane	50	N.D.
1,3-Dichloropropenes	50	N.D.
Carbon Tetrachloride	50	N.D.
Trichlorofluoromethane	250	N.D.
1,1,2-Trichloroethane	50	N.D.
1,1,2,2-Tetrachloroethane	50	N.D.
2-Chloroethylvinyl ether	50	N.D.

N.D. = None Detected above stated Detection Limit

Del Mar Analytical

Method of Analysis: EPA 8240

Gary Steube
Laboratory Director

Del Mar Analytical
18102 Sky Park South, Suite F • Irvine, CA 92714
(714) 261-1022 • FAX (714) 261-1228

ENSR Corporation
19782 MacArthur Blvd., Suite 365
Irvine, CA 92715

Date Sampled: 06/30/89
Date Received: 06/30/89
Date Analyzed: 07/14/89
Date Reported: 07/14/89

Attention: Bill Leever

Project: 0350-004-100, Amoco

Sample Description	Sample Number
Soil Sample B-14-15	9071082

Volatile Organics by Mass Spectrometry

	Detection Limit ug/Kg	Sample Results ug/Kg
Benzene	50	N.D.
Toluene	50	N.D.
Ethylbenzene	50	130
Chlorobenzene	50	N.D.
Xylenes (sum of 3 isomers)	50	N.D.
Acetone	250	N.D.
2-Butanone	250	N.D
Carbon Disulfide	100	N.D.
Vinyl Acetate	100	N.D.
4-Methyl-2-pentanone	100	N.D.
2-Hexanone	100	N.D.
Styrene	100	190

N.D. = None Detected above stated Detection Limit

Surrogate Recovery:

1,2-Dichloroethane-d4	87 %
Toluene-d8	96 %
4-Bromofluorobenzene	104 %

Del Mar Analytical

Gary Steube
Laboratory Director

Method of Analysis: EPA 8240

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ENSR Corporation
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Date Sampled: 06/30/89
Date Received: 06/30/89
Date Analyzed: 07/14/89
Date Reported: 07/14/89

Attention: Bill Leever

Project: 0350-004-100, Amoco

Sample Description
Soil Sample B-14-20

Sample Number
9061083

Volatile Organics by Mass Spectrometry

	Detection Limit ug/Kg	Sample Results ug/Kg
Tetrachloroethene	50	N.D.
1,1,1-Trichloroethane	50	N.D.
Trichloroethene	50	N.D.
1,1-Dichloroethane	50	N.D.
1,2-Dichloroethane	50	N.D.
1,1-Dichloroethene	50	N.D.
trans-1,2 Dichloroethene	50	N.D.
Methylene Chloride	50	N.D.
Chloroform	50	N.D.
Bromodichloromethane	50	N.D.
Dibromochloromethane	50	N.D.
Bromoform	50	N.D.
Bromomethane	50	N.D.
Chloromethane	50	N.D.
Chloroethane	50	N.D.
Vinyl Chloride	50	N.D.
1,2-Dichloropropane	50	N.D.
1,3-Dichloropropenes	50	N.D.
Carbon Tetrachloride	50	N.D.
Trichlorofluoromethane	250	N.D.
1,1,2-Trichloroethane	50	N.D.
1,1,2,2-Tetrachloroethane	50	N.D.
2-Chloroethylvinyl ether	50	N.D.

N.D. = None Detected above stated Detection Limit

Del Mar Analytical
Gary Steube
Laboratory Director

Method of Analysis: EPA 8240

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Irvine, CA 92715

Date Sampled: 06/30/89
Date Received: 06/30/89
Date Analyzed: 07/14/89
Date Reported: 07/14/89

Attention: Bill Leever

Project: 0350-004-100, Amoco

Sample Description	Sample Number
Soil Sample B-14-20	9071083

Volatile Organics by Mass Spectrometry

	Detection Limit ug/Kg	Sample Results ug/Kg
Benzene	50	N.D.
Toluene	50	N.D.
Ethylbenzene	50	N.D.
Chlorobenzene	50	N.D.
Xylenes (sum of 3 isomers)	50	N.D.
Acetone	250	N.D.
2-Butanone	250	N.D
Carbon Disulfide	100	N.D.
Vinyl Acetate	100	N.D.
4-Methyl-2-pentanone	100	N.D.
2-Hexanone	100	N.D.
Styrene	100	N.D.

N.D. = None Detected above stated Detection Limit

Surrogate Recovery:

1,2-Dichloroethane-d4	88 %
Toluene-d8	99 %
4-Bromofluorobenzene	102 %

Del Mar Analytical

Gary Steube
Laboratory Director

Method of Analysis: EPA 8240

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ENSR Constructors
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Irvine, CA 92715

Date Analyzed: 07/10/89
Date Reported: 07/11/89

Attention: Mark Wood

Project: 0350-004-100, Amoco

Sample Description
Method Blank

Volatile Organics by Mass Spectrometry

	Detection Limit ug/Kg	Sample Results ug/Kg
Tetrachloroethene	50	N.D.
1,1,1-Trichloroethane	50	N.D.
Trichloroethene	50	N.D.
1,1-Dichloroethane	50	N.D.
1,2-Dichloroethane	50	N.D.
1,1-Dichloroethene	50	N.D.
trans-1,2 Dichloroethene	50	N.D.
Methylene Chloride	50	N.D.
Chloroform	50	N.D.
Bromodichloromethane	50	N.D.
Dibromochloromethane	50	N.D.
Bromoform	50	N.D.
Bromomethane	50	N.D.
Chloromethane	50	N.D.
Chloroethane	50	N.D.
Vinyl Chloride	50	N.D.
1,2-Dichloropropane	50	N.D.
1,3-Dichloropropenes	50	N.D.
Carbon Tetrachloride	50	N.D.
Trichlorofluoromethane	250	N.D.
1,1,2-Trichloroethane	50	N.D.
1,1,2,2-Tetrachloroethane	50	N.D.
2-Chloroethylvinyl ether	50	N.D.

N.D. = None Detected above stated Detection Limit

Del Mar Analytical
Gary Steube
Laboratory Director

Method of Analysis: EPA 8240

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ENSR Constructors
19782 MacArthur Ave., Suite 365
Irvine, CA 92715

Date Analyzed: 07/10/89
Date Reported: 07/11/89

Attention: Mark Wood

Project: 0350-004-100, Amoco

Sample Description
Method Blank

Volatile Organics by Mass Spectrometry

	Detection Limit ug/Kg	Sample Results ug/Kg
Benzene	50	N.D.
Toluene	50	N.D.
Ethylbenzene	50	N.D.
Chlorobenzene	50	N.D.
Xylenes (sum of 3 isomers)	50	N.D.
Acetone	250	N.D.
2-Butanone	250	N.D
Carbon Disulfide	100	N.D.
Vinyl Acetate	100	N.D.
4-Methyl-2-pentanone	100	N.D.
2-Hexanone	100	N.D.
Styrene	100	N.D.

N.D. = None Detected above stated Detection Limit

Surrogate Recovery:

1,2-Dichloroethane-d4	92 %
Toluene-d8	94 %
4-Bromofluorobenzene	99 %

Del Mar Analytical

Gary Steube
Laboratory Director

Method of Analysis: EPA 8240

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ENSR Constructors
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Date Analyzed: 07/12/89
Date Reported: 07/13/89

Attention: Mark Wood

Project: 0350-004-100, Amoco

Sample Description
Method Blank

Volatile Organics by Mass Spectrometry

	Detection Limit ug/Kg	Sample Results ug/Kg
Tetrachloroethene	50	N.D.
1,1,1-Trichloroethane	50	N.D.
Trichloroethene	50	N.D.
1,1-Dichloroethane	50	N.D.
1,2-Dichloroethane	50	N.D.
1,1-Dichloroethene	50	N.D.
trans-1,2 Dichloroethene	50	N.D.
Methylene Chloride	50	N.D.
Chloroform	50	N.D.
Bromodichloromethane	50	N.D.
Dibromochloromethane	50	N.D.
Bromoform	50	N.D.
Bromomethane	50	N.D.
Chloromethane	50	N.D.
Chloroethane	50	N.D.
Vinyl Chloride	50	N.D.
1,2-Dichloropropane	50	N.D.
1,3-Dichloropropenes	50	N.D.
Carbon Tetrachloride	50	N.D.
Trichlorofluoromethane	250	N.D.
1,1,2-Trichloroethane	50	N.D.
1,1,2,2-Tetrachloroethane	50	N.D.
2-Chloroethylvinyl ether	50	N.D.

N.D. = None Detected above stated Detection Limit

Del Mar Analytical

Method of Analysis: EPA 8240

G. Stt
Gary Steube
Laboratory Director

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ENSR Constructors
19782 MacArthur Ave., Suite 365
Irvine, CA 92715

Date Analyzed: 07/12/89
Date Reported: 07/13/89

Attention: Mark Wood

Project: 0350-004-100, Amoco

Sample Description
Method Blank

Volatile Organics by Mass Spectrometry

	Detection Limit ug/Kg	Sample Results ug/Kg
Benzene	50	N.D.
Toluene	50	N.D.
Ethylbenzene	50	N.D.
Chlorobenzene	50	N.D.
Xylenes (sum of 3 isomers)	50	N.D.
Acetone	250	450
2-Butanone	250	N.D
Carbon Disulfide	100	N.D.
Vinyl Acetate	100	N.D.
4-Methyl-2-pentanone	100	N.D.
2-Hexanone	100	N.D.
Styrene	100	N.D.

N.D. = None Detected above stated Detection Limit

Surrogate Recovery:

1,2-Dichloroethane-d4	91 %
Toluene-d8	106 %
4-Bromofluorobenzene	107 %

Del Mar Analytical

Gary Steube
Laboratory Director

Method of Analysis: EPA 8240

APPENDIX D

AMBIENT TEMPERATURE HEADSPACE METHODOLOGY

AMBIENT TEMPERATURE HEADSPACE METHODOLOGY

During drilling and upon completion of groundwater sample collection, soil samples were screened with a portable Photovac 10S50 gas chromatograph photo-ionization detector (GC). Ambient temperature headspace analysis consists of taking a portion of the soil into a glass jar, then sealing the jar with aluminum foil, allowing sufficient time for possible hydrocarbons to volatilize, and using the GC to analyze for volatile organic compounds.

Ambient temperature headspace is sampled by piercing the aluminum foil with a Hamilton gas type syringe and extracting 50 or 100 ul or air. An air sample was then injected directly into the Photovac 10S50 portable GC. Programs for direct injection were set to allow adequate sample time with event one from 8 to 10 seconds and event three from 10 to 120 seconds. Any deviations are noted on the chromatograms. After each direct injection indicating possible contamination, a purge of hydrocarbon-free air was run. For comparison and calibration, samples of styrene, benzene, toluene, ethylbenzene, and meta-xylene (approximately 10 ppm concentration in air), tetrachloethene and trichloroethene (approximately 5 ppm concentration in air) were run to provide a standard. These chromatograms are included in Appendix E for each soil sample screened.

APPENDIX E

AMBIENT TEMPERATURE HEADSPACE
CHROMATOGRAMS

PHOTOVAC

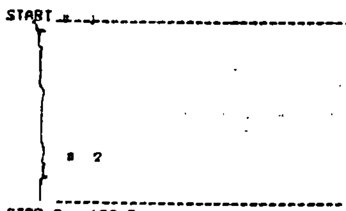
SAMPLE LIBRARY 1 JUN 27 1989 11: 5
ANALYSIS # 8 0350-084-100
INTERNAL TEMP 25 SAMPLE
GAIN 20 5PPM STYRENE

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	4	13.4	167.8 mVS
STYRENE	7	100.9	5.000 PPM

PHOTOVAC

1 COMPOUND	ID #	R.T.	LIMIT
STYRENE	1	100.9	25.00 PPM

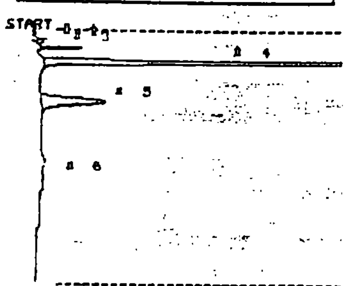
PHOTOVAC



STOP 0 135.7
SAMPLE LIBRARY 1 JUN 27 1989 11: 9
ANALYSIS # 9 0350-084-100
INTERNAL TEMP 30 PURGE
GAIN 20 B1-5

COMPOUND NAME PEAK R.T. AREA/PPM

PHOTOVAC

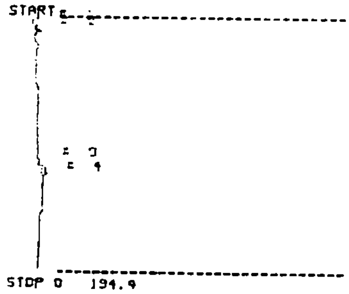


STOP 0 152.7
SAMPLE LIBRARY 1 JUN 27 1989 11:13
ANALYSIS # 10 0350-C84-100
INTERNAL TEMP 30 SAMPLE
GAIN 20 B1-5

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	3	14.4	142.4 mVS
UNKNOWN	4	24.5	3.5 VS
UNKNOWN	5	35.9	1.8 VS

(B-1-5)

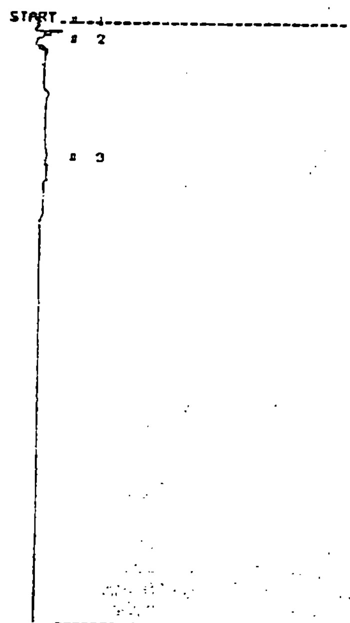
PHOTOVAC



STOP 0 194.9
SAMPLE LIBRARY 1 JUN 27 1989 11:18
ANALYSIS # 11 0350-084-100
INTERNAL TEMP 31 PURGE
GAIN 20 B1-10

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	4	125.2	115.5 mVS

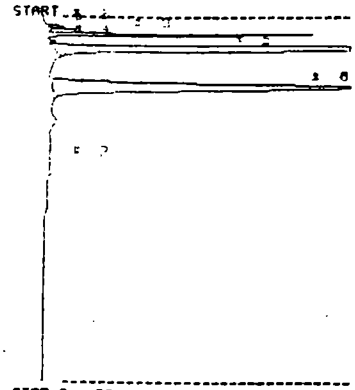
PHOTOVAC



STOP 0 461.6
SAMPLE LIBRARY 1 JUN 27 1989 11:28
ANALYSIS # 12 0350-084-100
INTERNAL TEMP 30 SAMPLE
GAIN 20 B1 AMBIENT AIR

COMPOUND NAME PEAK R.T. AREA/PPM

PHOTOVAC



STOP 0 281.4
SAMPLE LIBRARY 1 JUN 27 1989 11:42
ANALYSIS # 13 0350-C84-100
INTERNAL TEMP 25 SAMPLE
GAIN 20 B1-10

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	3	14.2	1.8 VS
UNKNOWN	5	24.3	6.8 VS
UNKNOWN	6	35.1	5.5 VS

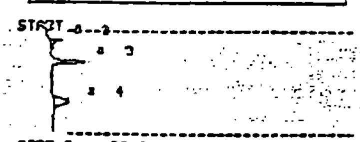
PHOTOVAC

SAMPLE LIBRARY 2 JUN 27 1989 11:42
ANALYSIS # 13 0350-C84-100
INTERNAL TEMP 25 SAMPLE
GAIN 20 B1-10

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	2	10.2	68.5 mVS
UNKNOWN	3	14.2	1.8 VS
UNKNOWN	5	24.3	6.8 VS
TOLUENE	6	35.1	13.89 PPM

(B-1-10)

PHOTOVAC

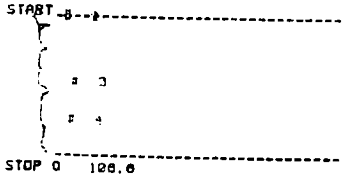


STOP 0 78.8
SAMPLE LIBRARY 1 JUN 27 1989 11:50
ANALYSIS # 14 0350-C84-100
INTERNAL TEMP 25 PURGE
GAIN 20 B1-15

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	3	24.7	180.3 mVS
UNKNOWN	4	56.1	248.3 mVS

PHOTOVAC

START



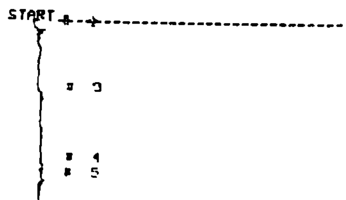
STOP 0 100.6
SAMPLE LIBRARY 1 JUN 28 1989 9:45
ANALYSIS # 9 0350-004-100
INTERNAL TEMP 27 SAMPLE
GAIN 20 B1-15

(B-1-15)

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	3	53.5	112.9 mVS

PHOTOVAC

START

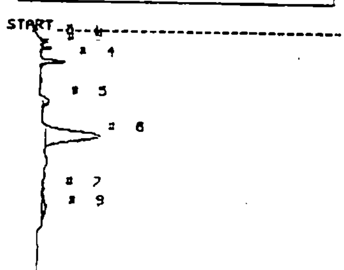


STOP 0 139.5
SAMPLE LIBRARY 1 JUN 28 1989 9:48
ANALYSIS # 10 0350-004-100
INTERNAL TEMP 28 PURGE
GAIN 20 B2-5

COMPOUND NAME	PEAK	R.T.	AREA/PPM

PHOTOVAC

START



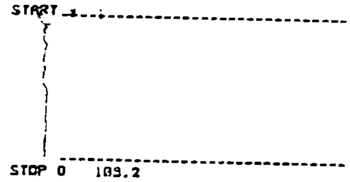
(B-2-5)

STOP 0 185.1
SAMPLE LIBRARY 1 JUN 28 1989 9:52
ANALYSIS # 11 0350-004-100
INTERNAL TEMP 28 SAMPLE
GAIN 20 B2-5

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	4	25.0	119.7 mVS
UNKNOWN	5	56.7	103.4 mVS
ETHYLBENZENE	6	84.1	4.335 PPM
UNKNOWN	8	140.0	112.2 mVS

PHOTOVAC

START

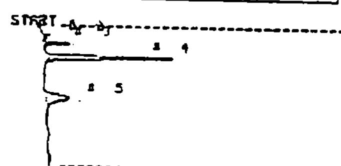


STOP 0 103.2
SAMPLE LIBRARY 1 JUN 28 1989 9:55
ANALYSIS # 12 0350-004-100
INTERNAL TEMP 28 PURGE
GAIN 20 B2-10

COMPOUND NAME	PEAK	R.T.	AREA/PPM

PHOTOVAC

START



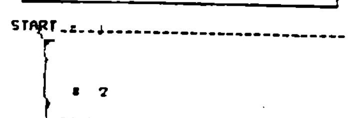
(B-2-10)

STOP 0 108.4
SAMPLE LIBRARY 1 JUN 28 1989 9:58
ANALYSIS # 13 0350-004-100
INTERNAL TEMP 29 SAMPLE
GAIN 20 B2-10

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	4	25.4	839.4 mVS
UNKNOWN	5	57.5	394.8 mVS

PHOTOVAC

START

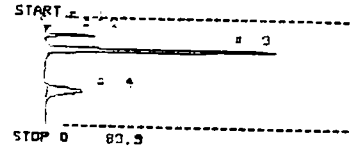


STOP 0 68.1
SAMPLE LIBRARY 1 JUN 28 1989 10:20
ANALYSIS # 14 0359-004-100
INTERNAL TEMP 25 PURGE
GAIN 20 B2-15

COMPOUND NAME	PEAK	R.T.	AREA/PPM

PHOTOVAC

START



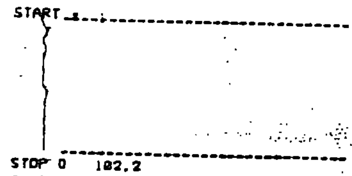
STOP 0 83.9
SAMPLE LIBRARY 1 JUN 28 1989 10:22
ANALYSIS # 15 0350-004-100
INTERNAL TEMP 28 SAMPLE
GAIN 20 B2-15

(B-2-1

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	2	14.5	160.4 mVS
UNKNOWN	3	25.7	1.5 VS
UNKNOWN	4	58.3	828.3 mVS

PHOTOVAC

START

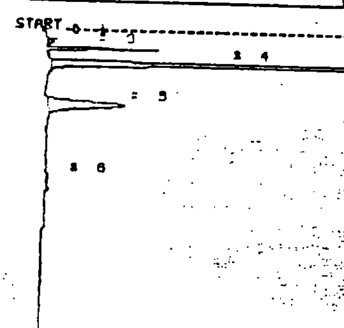


STOP 0 102.2
SAMPLE LIBRARY 1 JUN 28 1989 10:24
ANALYSIS # 16 0350-004-100
INTERNAL TEMP 27 PURGE
GAIN 20 B2-20

COMPOUND NAME	PEAK	R.T.	AREA/PPM

PHOTOVAC

START



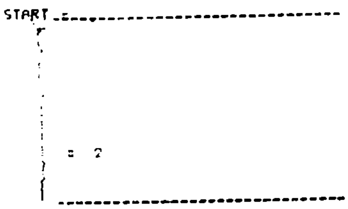
(B-2-20)

STOP 0 230.8
SAMPLE LIBRARY 1 JUN 28 1989 10:29
ANALYSIS # 17 0350-004-100
INTERNAL TEMP 27 SAMPLE
GAIN 20 B2-20

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	3	15.1	381.2 mVS
UNKNOWN	4	25.7	3.5 VS
UNKNOWN	5	59.5	1.3 VS

PHOTOVAC

START

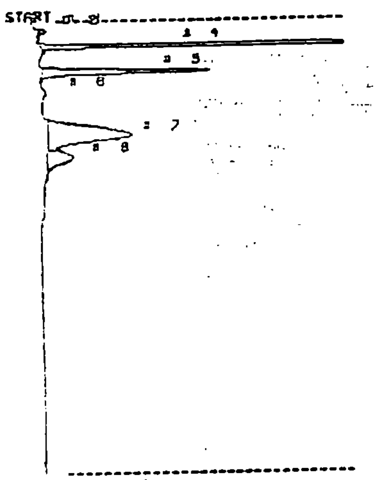


STOP 0 141.2
SAMPLE LIBRARY 1 JUN 28 1989 10:35
ANALYSIS # 18 0350-004-100
INTERNAL TEMP 27 PURGE STND
GAIN 20 10PPM BTE

COMPOUND NAME	PEAK	R.T.	AREA/PPM

PHOTOVAC

START



STOP 0 348.8
SAMPLE LIBRARY 1 JUN 28 1989 10:41
ANALYSIS # 19 0350-004-100
INTERNAL TEMP 26 SAMPLE STND
GAIN 20 10PPM BTE

OFFSET 14.0 mU
CHART SPEED 1 cm/min
SLOPE SENS. 10 14 6 mU/Sec
WINDOW +/- 10 Percent
MINIMUM AREA 100 mUSec
TIMER DELAY 10.0 Sec
ANALYSIS TIME 900.0 Sec
CYCLE TIME 0 Min

COMPOUND NAME	PEAK	R.T.	AREA/PPM
BENZENE	4	13.8	10.12 PPM
TOLUENE	5	41.1	10.00 PPM
ETHYLBENZENE	7	50.7	10.24 PPM
STYRENE	8	108.1	2.383 PPM

PHOTOVAC

START

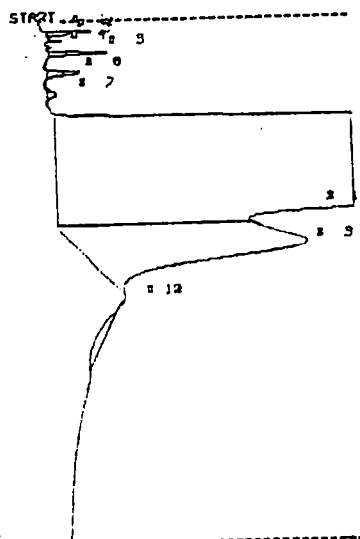
STOP 0 84.5
SAMPLE LIBRARY 1 JUN 28 1989 10:48
ANALYSIS # 20 0350-004-100
INTERNAL TEMP 26 PURGE
GAIN 20 B3-5

OFFSET 13.0 mU
CHART SPEED 1 cm/min
SLOPE SENS. 10 14 6 mU/Sec
WINDOW +/- 10 Percent
MINIMUM AREA 100 mUSec
TIMER DELAY 10.0 Sec
ANALYSIS TIME 900.0 Sec
CYCLE TIME 0 Min

COMPOUND NAME	PEAK	R.T.	AREA/PPM

PHOTOVAC

START



STOP 0 403.4
SAMPLE LIBRARY 1 JUN 28 1989 10:55
ANALYSIS # 21 0350-004-100
INTERNAL TEMP 27 SAMPLE
GAIN 20 B3-5

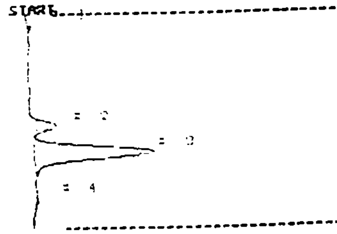
COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	8.7	105.7 mUS
UNKNOWN	5	26.3	387.1 mUS
TOLUENE	6	42.5	1.887 PPM
UNKNOWN	7	58.7	150.4 mUS
STYRENE	8	115.2	3797. PPM
UNKNOWN	9	179.2	20.3 US

switch to 10
Gain to
and purge

(B-3-5)

PHOTOVAC

START

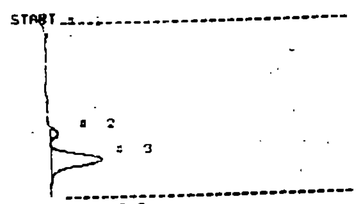


STOP 0 163.9
SAMPLE LIBRARY 1 JUN 28 1989 10:59
ANALYSIS # 22 0350-004-100
INTERNAL TEMP 27 PURGE
GAIN 10 B3-5

COMPOUND NAME	PEAK	R.T.	AREA/PPM
ETHYLBENZENE	2	88.3	3.624 PPM
STYRENE	3	109.8	28.20 PPM

PHOTOVAC

START

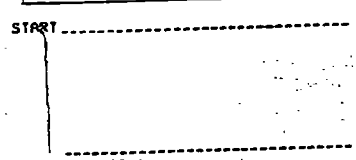


STOP 0 135.3
SAMPLE LIBRARY 1 JUN 28 1989 11:3
ANALYSIS # 23 0350-004-100
INTERNAL TEMP 27 PURGE
GAIN 10 B3-10

COMPOUND NAME	PEAK	R.T.	AREA/PPM
ETHYLBENZENE	2	88.3	1.116 PPM
STYRENE	3	109.8	11.36 PPM

PHOTOVAC

START

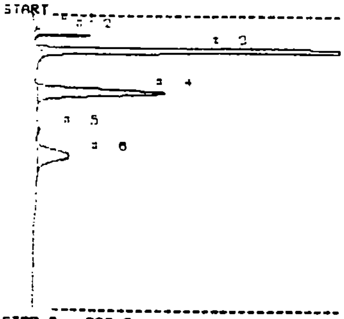


STOP 0 92.1
SAMPLE LIBRARY 1 JUN 28 1989 11:5
ANALYSIS # 24 0350-004-100
INTERNAL TEMP 28 PURGE
GAIN 10 B3-10

COMPOUND NAME	PEAK	R.T.	AREA/PPM

PHOTOVAC

START



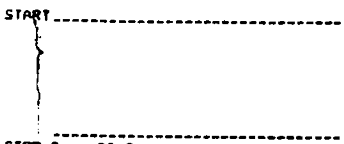
STOP 0 225.7
SAMPLE LIBRARY 1 JUN 28 1989 11:10
ANALYSIS # 25 0350-004-100
INTERNAL TEMP 28 SAMPLE
GAIN 10 B3-10

(B-3-10)

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	2	15.7	131.9 mVS
UNKNOWN	3	26.8	5.5 VS
UNKNOWN	4	60.3	2.2 VS
STYRENE	6	110.5	6.761 PPM

PHOTOVAC

START

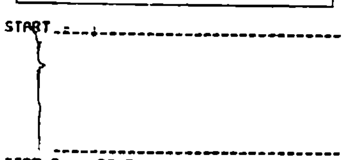


STOP 0 88.2
SAMPLE LIBRARY 1 JUN 28 1989 11:13
ANALYSIS # 26 0350-004-100
INTERNAL TEMP 28 PURGE
GAIN 10 B3-15

COMPOUND NAME PEAK R.T. AREA/PPM

PHOTOVAC

START



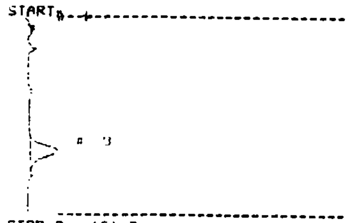
STOP 0 83.9
SAMPLE LIBRARY 1 JUN 28 1989 11:15
ANALYSIS # 27 0350-004-100
INTERNAL TEMP 27 SAMPLE
GAIN 10 B3-15

COMPOUND NAME PEAK R.T. AREA/PPM

switch Gain to 20

PHOTOVAC

START



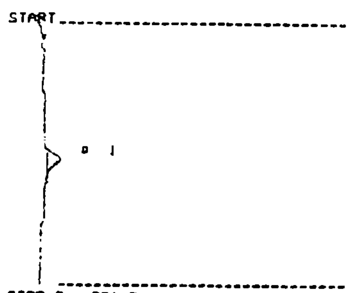
STOP 0 151.7
SAMPLE LIBRARY 1 JUN 28 1989 11:22
ANALYSIS # 29 0350-004-100
INTERNAL TEMP 28 SAMPLE
GAIN 20 B3-15

(B-3-15)

COMPOUND NAME	PEAK	R.T.	AREA/PPM
STYRENE	3	105.7	2.858 PPM

PHOTOVAC

START

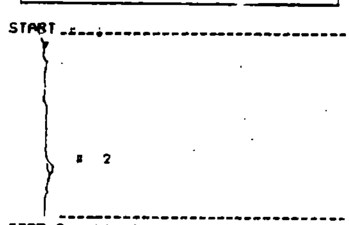


STOP 0 201.6
SAMPLE LIBRARY 1 JUN 28 1989 11:26
ANALYSIS # 29 0350-004-100
INTERNAL TEMP 27 PURGE
GAIN 20 B3-20

COMPOUND NAME	PEAK	R.T.	AREA/PPM
STYRENE	1	107.8	1.433 PPM

PHOTOVAC

START

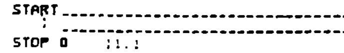


STOP 0 141.4
SAMPLE LIBRARY 1 JUN 28 1989 11:29
ANALYSIS # 30 0350-004-100
INTERNAL TEMP 28 PURGE
GAIN 20 B3-20

COMPOUND NAME	PEAK	R.T.	AREA/PPM
STYRENE	2	106.9	358.7 PPB

PHOTOVAC

START

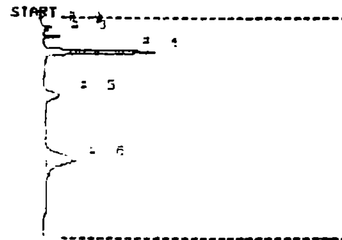


STOP 0 11.1
SAMPLE LIBRARY 1 JUN 28 1989 11:29
ANALYSIS # 31 0350-004-100
INTERNAL TEMP 27 PURGE
GAIN 20 B3-20

COMPOUND NAME PEAK R.T. AREA/PPM

PHOTOVAC

START



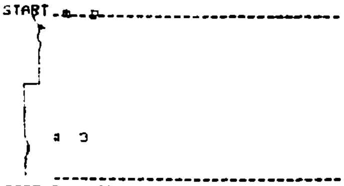
STOP 0 171.2
SAMPLE LIBRARY 1 JUN 28 1989 11:32
ANALYSIS # 32 0350-004-100
INTERNAL TEMP 28 SAMPLE
GAIN 20 B3-20

(B-3-20)

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	4	27.2	751.3 mVS
UNKNOWN	5	61.3	223.2 mVS
STYRENE	6	113.2	3.018 PPM

change gain to 10

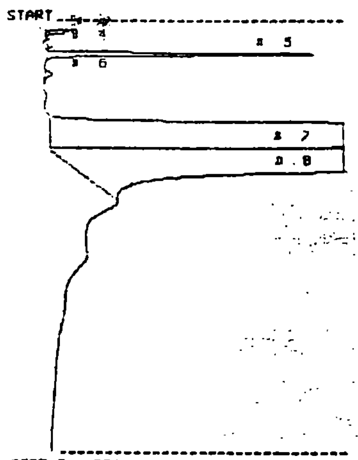
PHOTOVAC



STOP 0 123.5
SAMPLE LIBRARY 1 JUN 28 1989 11:36
ANALYSIS # 33 0350-004-100
INTERNAL TEMP 28 PURGE
GAIN 10 B4-5

COMPOUND NAME PEAK R.T. AREA/PPM

PHOTOVAC

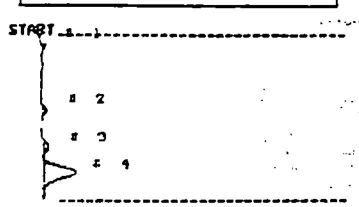


(B-4-5)

STOP 0 334.4
SAMPLE LIBRARY 1 JUN 28 1989 11:45
ANALYSIS # 34 0350-004-100
INTERNAL TEMP 27 SAMPLE
GAIN 10 B4-5

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	3	26.8	1.9 US
ETHYLBENZENE	7	88.9	459.0 PPM
STYRENE	8	109.2	152.4 PPM

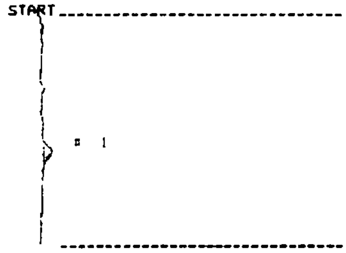
PHOTOVAC



STOP 0 124.8
SAMPLE LIBRARY 1 JUN 28 1989 11:49
ANALYSIS # 35 0350-004-100
INTERNAL TEMP 27 PURGE
GAIN 10 B4-10

COMPOUND NAME	PEAK	R.T.	AREA/PPM
STYRENS	4	100.0	7.087 PPM

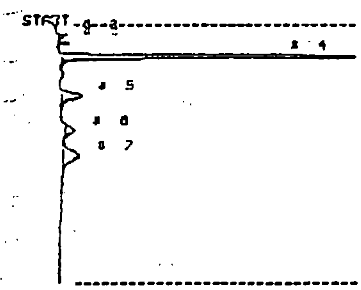
PHOTOVAC



STOP 0 176.8
SAMPLE LIBRARY 1 JUN 28 1989 11:52
ANALYSIS # 36 0350-004-100
INTERNAL TEMP 28 PURGE
GAIN 10 B4-10

COMPOUND NAME	PEAK	R.T.	AREA/PPM
STYRENE	1	107.5	1.630 PPM

PHOTOVAC



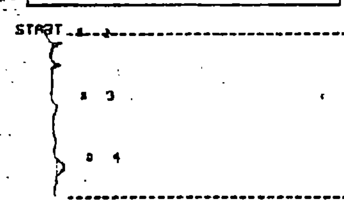
(B-4-10)

STOP 0 208.8
SAMPLE LIBRARY 1 JUN 28 1989 11:58
ANALYSIS # 37 0350-004-100
INTERNAL TEMP 28 SAMPLE
GAIN 10 B4-10

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	4	24.6	2.4 US
UNKNOWN	5	58.5	308.9 mUS
ETHYLBENZENE	6	84.1	1.255 PPM
STYRENE	7	103.6	3.084 PPM

Change gain to 20

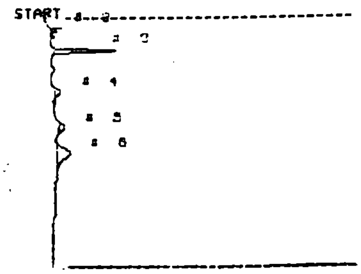
PHOTOVAC



STOP 0 122.8
SAMPLE LIBRARY 1 JUN 28 1989 12: 2
ANALYSIS # 38 0350-004-100
INTERNAL TEMP 29 PURGE
GAIN 20 B4-15

COMPOUND NAME	PEAK	R.T.	AREA/PPM
STYRENE	4	103.0	735.2 PPB

PHOTOVAC



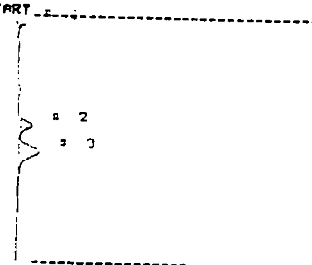
(B-4-15)

STOP 0 193.1
SAMPLE LIBRARY 1 JUN 28 1989 12: 7
ANALYSIS # 39 0350-004-100
INTERNAL TEMP 29 SAMPLE
GAIN 20 B4-15

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	3	25.2	390.2 mUS
ETHYLBENZENE	5	85.0	402.5 PPB
STYRENE	6	104.8	1.435 PPM

PHOTOVAC

START

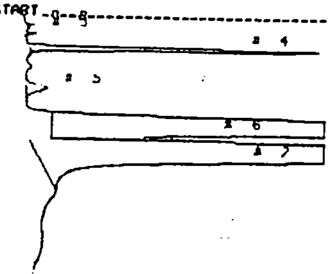


STOP 0 163.5
SAMPLE LIBRARY 1 JUN 28 1989 13:13
ANALYSIS # 43 0350-004-100
INTERNAL TEMP 27 PURGE
GAIN 10 B4-20

COMPOUND NAME	PEAK	R.T.	AREA/PPM
ETHYLBENZENE	2	87.4	1.585 PPM
STYRENE	3	107.8	3.386 PPM

PHOTOVAC

START



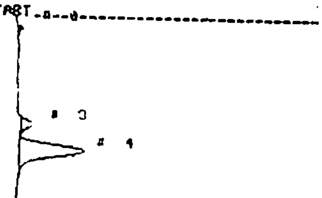
(B-4-20)

STOP 0 204.1
SAMPLE LIBRARY 1 JUN 28 1989 13:18
ANALYSIS # 44 0350-004-100
INTERNAL TEMP 27 SAMPLE
GAIN 10 B4-20

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	4	25.8	2.0 US
UNKNOWN	5	58.7	316.6 mUS
ETHYLBENZENE	6	83.5	221.8 PPM
STYRENE	7	103.8	325.3 PPM

PHOTOVAC

START

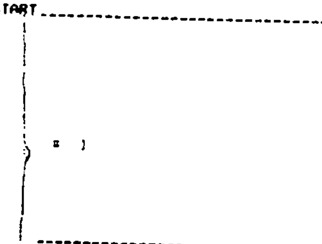


STOP 0 147.3
SAMPLE LIBRARY 1 JUN 28 1989 13:22
ANALYSIS # 45 0350-004-100
INTERNAL TEMP 28 PURGE STND
GAIN 10 10PPM BTE

COMPOUND NAME	PEAK	R.T.	AREA/PPM
ETHYLBENZENE	3	84.9	1.476 PPM
STYRENE	4	104.2	14.42 PPM

PHOTOVAC

START

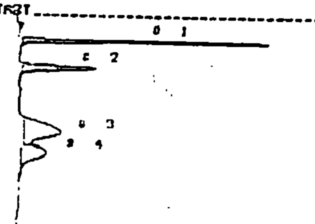


STOP 0 173.7
SAMPLE LIBRARY 1 JUN 28 1989 13:26
ANALYSIS # 46 0350-004-100
INTERNAL TEMP 28 PURGE STND
GAIN 10 10PPM BTE

COMPOUND NAME PEAK R.T. AREA/PPM

PHOTOVAC

START

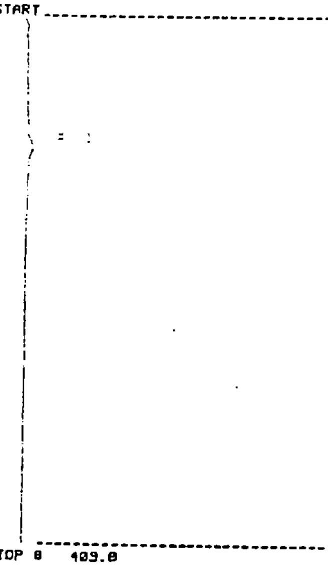


STOP 0 163.7
SAMPLE LIBRARY 1 JUN 28 1989 13:31
ANALYSIS # 47 0350-004-100
INTERNAL TEMP 29 SAMPLE STND
GAIN 10 10PPM BTE

COMPOUND NAME	PEAK	R.T.	AREA/PPM
BENZENE	1	28.0	3.358 PPM
TOLUENE	2	42.5	8.502 PPM
ETHYLBENZENE	3	83.1	9.459 PPM
STYRENE	4	105.3	5.841 PPM

PHOTOVAC

START

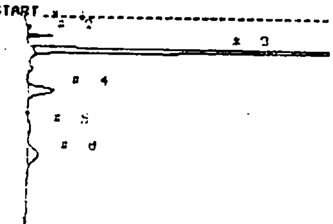


STOP 0 409.0
SAMPLE LIBRARY 1 JUN 28 1989 13:40
ANALYSIS # 48 0350-004-100
INTERNAL TEMP 28 PURGE
GAIN 10 B5-20

COMPOUND NAME PEAK R.T. AREA/PPM

PHOTOVAC

START

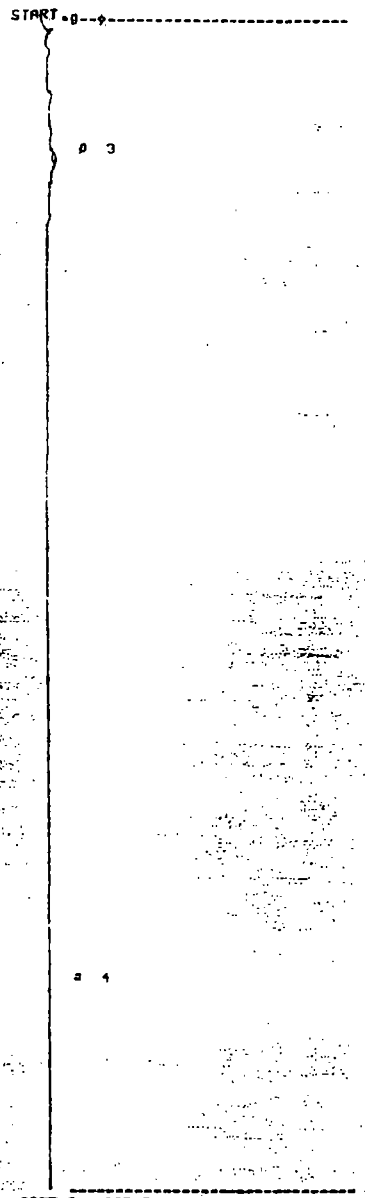


(B-5-20)

STOP 0 162.5
SAMPLE LIBRARY 1 JUN 28 1989 13:43
ANALYSIS # 49 0350-004-100
INTERNAL TEMP 29 SAMPLE
GAIN 10 B5-20

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	3	25.9	3.0 US
UNKNOWN	4	58.9	425.4 mUS
STYRENE	6	100.1	1.389 PPM

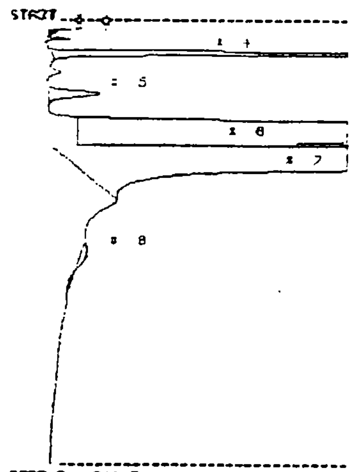
PHOTOVAC



STOP 0 300.0
SAMPLE LIBRARY 1 JUN 28 1989 12:22
ANALYSIS # 40 0350-004-100
INTERNAL TEMP 26 PURGE
GAIN 20 B4-20

COMPOUND NAME	PEAK	R.T.	AREA/PPM

PHOTOVAC



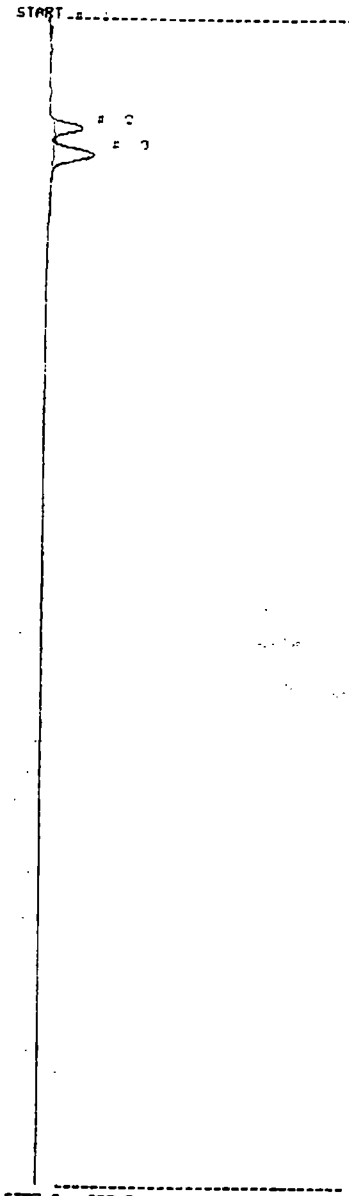
(B-4-20)

STOP 0 341.7
SAMPLE LIBRARY 1 JUN 28 1989 12:53
ANALYSIS # 41 0350-004-100
INTERNAL TEMP 26 SAMPLE
GAIN 20 B4-20

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	4	25.9	4.9 VS
UNKNOWN	5	58.1	894.2 mVS
ETHYLBENZENE	6	86.9	186.6 PPM
STYRENE	7	106.5	99.70 PPM
UNKNOWN	8	178.7	200.6 mVS

change gain to 10

PHOTOVAC

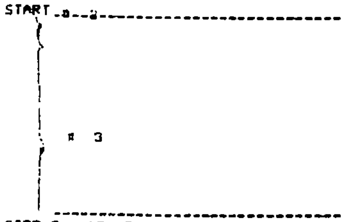


STOP 0 300.0
SAMPLE LIBRARY 1 JUN 28 1989 13:9
ANALYSIS # 42 0350-004-100
INTERNAL TEMP 25 PURGE
GAIN 10 B4-20

COMPOUND NAME	PEAK	R.T.	AREA/PPM
ETHYLBENZENE	2	87.1	4.471 PPM
STYRENE	3	107.2	5.180 PPM

PHOTOVAC

START

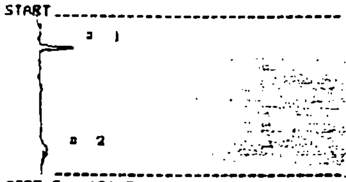


STOP 0 151.2
SAMPLE LIBRARY 1 JUN 28 1989 13:48
ANALYSIS # 50 0350-004-100
INTERNAL TEMP 31 PURGE
GAIN 10 B5-15

COMPOUND NAME PEAK R.T. AREA/PPM

PHOTOVAC

START



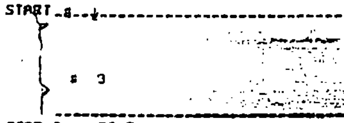
(B-5-15)

STOP 0 121.7
SAMPLE LIBRARY 1 JUN 28 1989 13:49
ANALYSIS # 51 0350-004-100
INTERNAL TEMP 31 SAMPLE
GAIN 10 B5-15

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	25.8	188.5 mVS

PHOTOVAC

START

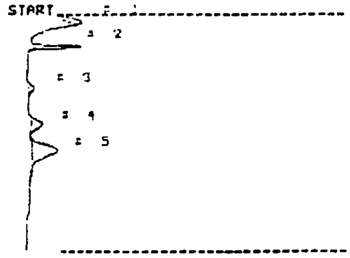


STOP 0 76.0
SAMPLE LIBRARY 1 JUN 28 1989 13:51
ANALYSIS # 52 0350-C04-100
INTERNAL TEMP 31 PURGE
GAIN 20 B5-15

COMPOUND NAME PEAK R.T. AREA/PPM

PHOTOVAC

START



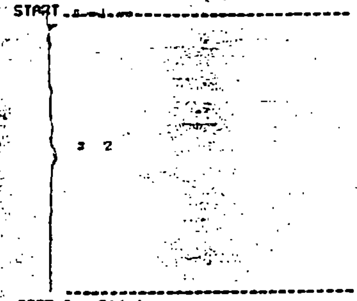
(B-5-15)

STOP 0 181.7
SAMPLE LIBRARY 1 JUN 28 1989 13:54
ANALYSIS # 53 0350-C04-100
INTERNAL TEMP 32 SAMPLE
GAIN 20 B5-15

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	2	25.7	385.1 mVS
ETHYLBENZENE	4	87.1	855.3 PPB
STYRENE	5	102.5	2.760 PPM

PHOTOVAC

START

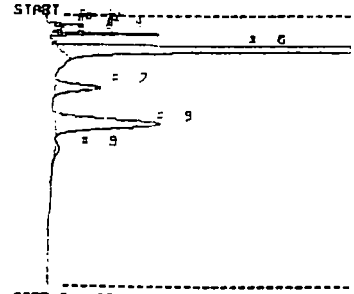


STOP 0 214.1
SAMPLE LIBRARY 1 JUN 28 1989 14: 8
ANALYSIS # 54 0350-C04-100
INTERNAL TEMP 32 PURGE
GAIN 10 B5-10

COMPOUND NAME PEAK R.T. AREA/PPM

PHOTOVAC

START



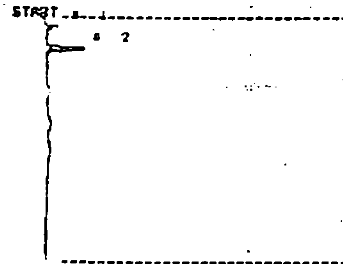
(B-5-10)

STOP 0 208.6
SAMPLE LIBRARY 1 JUN 28 1989 14: 5
ANALYSIS # 55 0350-004-100
INTERNAL TEMP 32 SAMPLE
GAIN 10 B5-10

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	4	14.7	335.0 mVS
UNKNOWN	6	25.4	10.1 VS
UNKNOWN	7	57.5	754.3 mVS
ETHYLBENZENE	8	85.9	10.77 PPM

PHOTOVAC

START

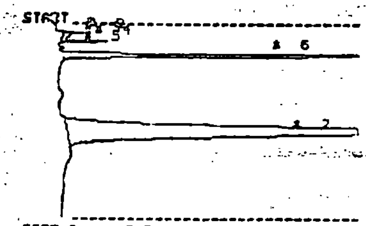


STOP 0 189.8
SAMPLE LIBRARY 1 JUN 28 1989 14:10
ANALYSIS # 56 0350-004-100
INTERNAL TEMP 32 PURGE
GAIN 10 B5-5

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	2	25.8	215.0 mVS

PHOTOVAC

START



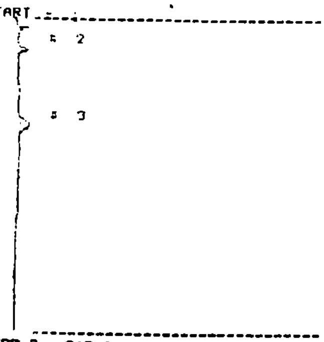
(B-5-5)

STOP 0 147.2
SAMPLE LIBRARY 1 JUN 28 1989 14:13
ANALYSIS # 57 0350-004-100
INTERNAL TEMP 33 SAMPLE
GAIN 10 B5-5

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	4	14.3	153.2 mVS
UNKNOWN	6	24.3	2.5 VS
ETHYLBENZENE	7	82.0	70.40 PPM

PHOTOVAC

START

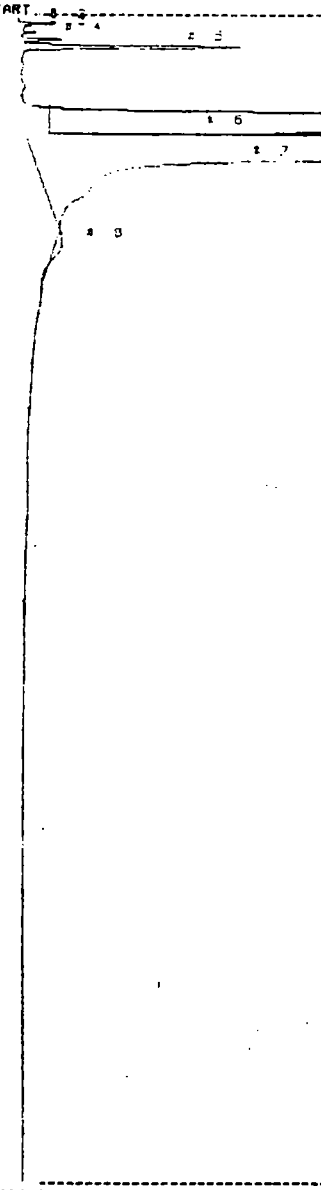


STOP 0 240.1
SAMPLE LIBRARY 1 JUN 28 1989 14:19
ANALYSIS # 58 0350-094-100
INTERNAL TEMP 32 PURGE
GAIN 10 B6-5

COMPOUND NAME	PEAK	R.T.	AREA/PPM
ETHYLBENZENE	3	84.1	1.314 PPM

PHOTOVAC

START



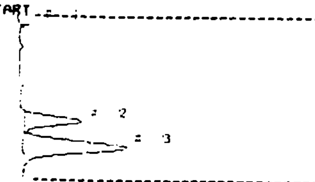
(B-6-5)

STOP 0 900.0
SAMPLE LIBRARY 1 JUN 28 1989 14:34
ANALYSIS # 59 0350-004-100
INTERNAL TEMP 30 SAMPLE
GAIN 10 B6-5

COMPOUND NAME	PEAK	R.T.	AREA/PPM
BENZENE	4	19.7	1.297 PPM
UNKNOWN	5	24.8	1.4 VS
ETHYLBENZENE	6	83.1	321.1 PPM
STYRENE	7	102.7	239.8 PPM
UNKNOWN	8	170.2	270.8 mVS

PHOTOVAC

START



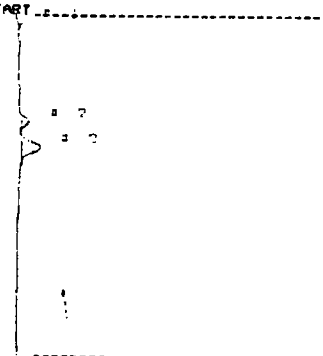
(B-6-10)

STOP 0 125.6
SAMPLE LIBRARY 1 JUN 28 1989 14:40
ANALYSIS # 60 0350-004-100
INTERNAL TEMP 32 PURGE
GAIN 10 B6-10

COMPOUND NAME	PEAK	R.T.	AREA/PPM
ETHYLBENZENE	2	83.9	9.577 PPM
STYRENE	3	103.0	23.52 PPM

PHOTOVAC

START

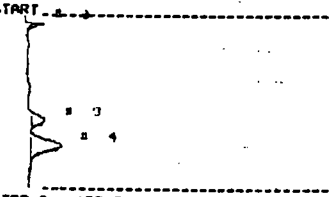


STOP 0 200.6
SAMPLE LIBRARY 1 JUN 28 1989 14:45
ANALYSIS # 61 0350-004-100
INTERNAL TEMP 32 PURGE
GAIN 10 B6-10

COMPOUND NAME	PEAK	R.T.	AREA/PPM
ETHYLBENZENE	2	83.8	690.4 PPB
STYRENE	3	103.3	3.750 PPM

PHOTOVAC

START

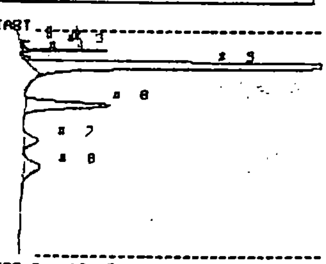


STOP 0 133.0
SAMPLE LIBRARY 1 JUN 28 1989 14:48
ANALYSIS # 62 0350-004-100
INTERNAL TEMP 32 PURGE
GAIN 10 B6-10

COMPOUND NAME	PEAK	R.T.	AREA/PPM
ETHYLBENZENE	3	83.5	1.068 PPM
STYRENE	4	103.0	6.352 PPM

PHOTOVAC

START



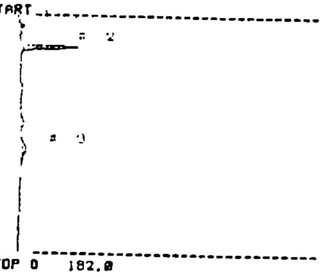
(B-6-10)

STOP 0 171.5
SAMPLE LIBRARY 1 JUN 28 1989 14:52
ANALYSIS # 63 0350-004-100
INTERNAL TEMP 32 SAMPLE
GAIN 10 B6-10

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	3	15.8	270.0 mUS
UNKNOWN	5	26.4	9.3 US
UNKNOWN	6	38.3	1.4 US
ETHYLBENZENE	7	86.9	1.664 PPM
STYRENE	8	106.0	3.354 PPM

PHOTOVAC

START

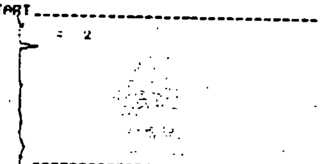


STOP 0 182.0
SAMPLE LIBRARY 1 JUN 28 1989 14:56
ANALYSIS # 64 0350-004-100
INTERNAL TEMP 32 PURGE
GAIN 10 B6-15

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	2	24.3	346.0 mUS

PHOTOVAC

START

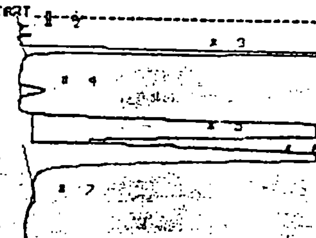


STOP 0 120.7
SAMPLE LIBRARY 1 JUN 28 1989 15: 0
ANALYSIS # 65 0350-004-100
INTERNAL TEMP 32 PURGE
GAIN 10 B6-15

COMPOUND NAME PEAK R.T. AREA/PPM

PHOTOVAC

START



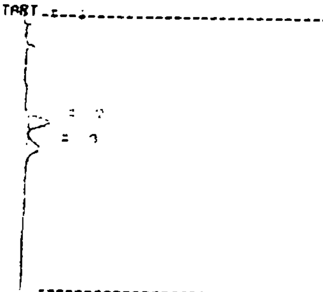
(B-6-15)

STOP 0 172.2
SAMPLE LIBRARY 1 JUN 28 1989 15: 3
ANALYSIS # 66 0350-004-100
INTERNAL TEMP 33 SAMPLE
GAIN 10 B6-15

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	3	24.7	4.7 US
UNKNOWN	4	56.9	388.6 mUS
ETHYLBENZENE	5	83.4	206.5 PPM
STYRENE	6	102.7	106.2 PPM

PHOTOVAC

START

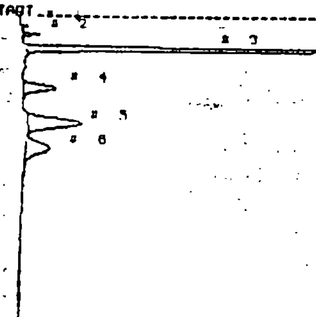


STOP 0 210.1
SAMPLE LIBRARY 1 JUN 28 1989 15: 0
ANALYSIS # 67 0350-004-100
INTERNAL TEMP 33 PURGE
GAIN 10 B6-20

COMPOUND NAME	PEAK	R.T.	AREA/PPM
ETHYLBENZENE	2	83.8	3.036 PPM
STYRENE	3	103.3	2.925 PPM

PHOTOVAC

START



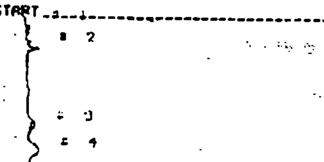
(B-6-20)

STOP 0 235.3
SAMPLE LIBRARY 1 JUN 28 1989 15:14
ANALYSIS # 68 0350-004-100
INTERNAL TEMP 33 SAMPLE
GAIN 10 B6-20

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	3	23.4	3.2 US
UNKNOWN	4	58.9	457.9 mUS
ETHYLBENZENE	5	84.7	8.319 PPM
STYRENE	6	104.2	4.494 PPM

PHOTOVAC

START

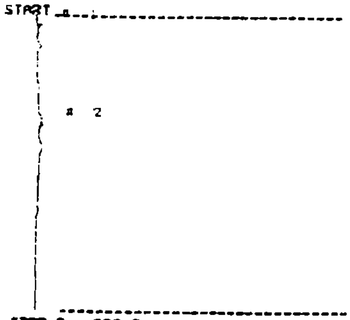


STOP 0 114.9
SAMPLE LIBRARY 1 JUN 28 1989 15:18
ANALYSIS # 69 0350-004-100
INTERNAL TEMP 34 PURGE
GAIN 10 B7-5

COMPOUND NAME PEAK R.T. AREA/PPM

PHOTOVAC

START

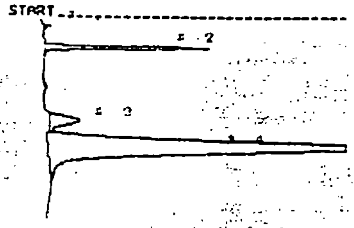


STOP 0 227.3
SAMPLE LIBRARY 1 JUN 28 1989 15:22
ANALYSIS # 70 0350-004-100
INTERNAL TEMP 34 PURGE
GAIN 10 B7-5

COMPOUND NAME	PEAK	R.T.	AREA/PPM

PHOTOVAC

START



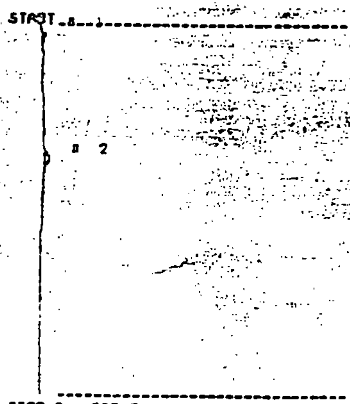
(B-7-5)

SIS # 71 0350-004-100
INTERNAL TEMP 35 SAMPLE
GAIN 10 B7-5

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	2	24.8	1.1 US
ETHYLBENZENE	3	83.8	5.381 PPM
STYRENE	4	102.1	85.54 PPM

PHOTOVAC

START

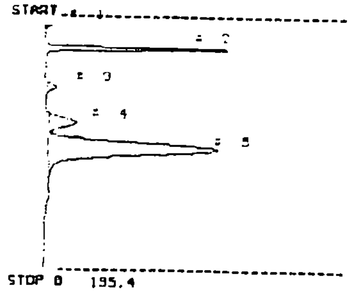


STOP 0 282.0
SAMPLE LIBRARY 1 JUN 28 1989 15:31
ANALYSIS # 72 0350-004-100
INTERNAL TEMP 34 PURGE
GAIN 10 B7-10

COMPOUND NAME	PEAK	R.T.	AREA/PPM
[illegible]	[illegible]	[illegible]	[illegible]

PHOTOVAC

START



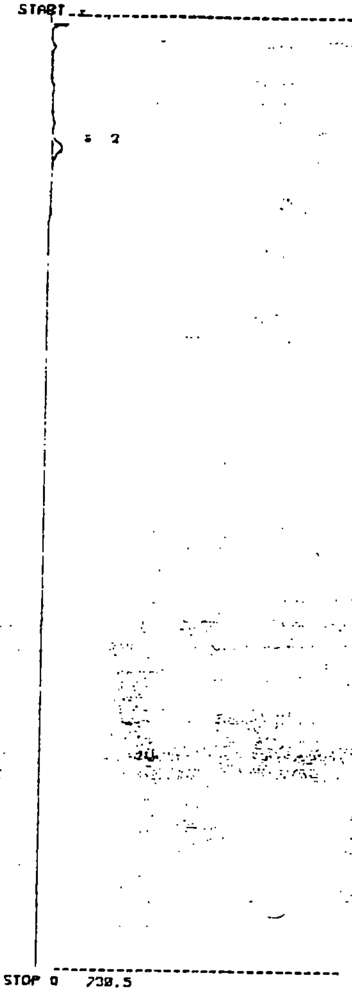
(B-7-10)

STOP 0 195.4
SAMPLE LIBRARY 1 JUN 28 1989 15:36
ANALYSIS # 73 0350-004-100
INTERNAL TEMP 36 SAMPLE
GAIN 10 B7-10

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	2	25.5	1.2 US
UNKNOWN	3	58.9	158.4 mUS
ETHYLBENZENE	4	84.4	4.628 PPM
STYRENE	5	103.9	39.35 PPM

PHOTOVAC

START

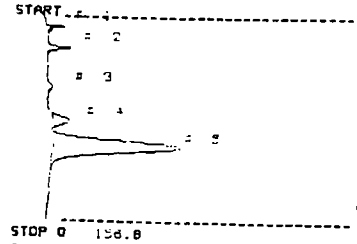


STOP 0 730.5
SAMPLE LIBRARY 1 JUN 28 1989 15:49
ANALYSIS # 74 0350-004-100
INTERNAL TEMP 33 PURGE
GAIN 10 B7-15

COMPOUND NAME	PEAK	R.T.	AREA/PPM
STYRENE	2	104.8	1.760 PPM

PHOTOVAC

START



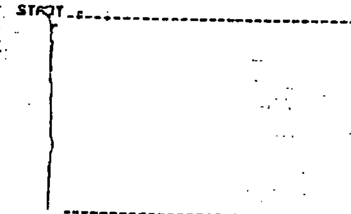
(B-7-15)

STOP 0 158.8
SAMPLE LIBRARY 1 JUN 28 1989 16:2
ANALYSIS # 75 0350-004-100
INTERNAL TEMP 35 SAMPLE
GAIN 10 B7-15

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	2	25.4	185.3 mUS
ETHYLBENZENE	4	83.2	2.404 PPM
STYRENE	5	102.4	27.85 PPM

PHOTOVAC

START

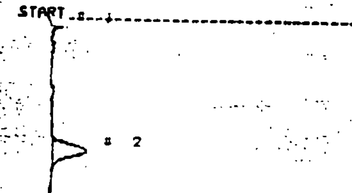


STOP 0 150.8
SAMPLE LIBRARY 1 JUN 28 1989 16:6
ANALYSIS # 76 0350-004-100
INTERNAL TEMP 35 PURGE STND
GAIN 10 5PPM STYRENE

COMPOUND NAME	PEAK	R.T.	AREA/PPM

PHOTOVAC

START

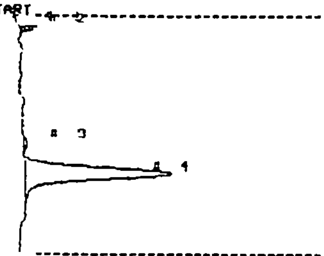


STOP 0 134.5
SAMPLE LIBRARY 1 JUN 28 1989 16:9
ANALYSIS # 77 0350-004-100
INTERNAL TEMP 38 SAMPLE STND
GAIN 10 5PPM STYRENE

COMPOUND NAME	PEAK	R.T.	AREA/PPM
STYRENE	2	101.8	2.411 PPM

PHOTOVAC

START

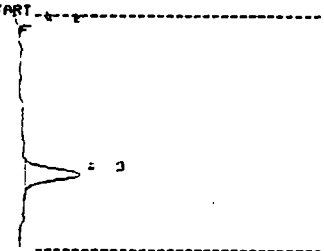


STOP 0 184.2
SAMPLE LIBRARY 1 JUN 29 1989 9:32
ANALYSIS # 17 0350-004-100
INTERNAL TEMP 28 PURGE
GAIN 20 8-8-10

COMPOUND NAME	PEAK	R.T.	AREA/PPM
STYRENE	4	125.8	14.64 PPM

PHOTOVAC

START

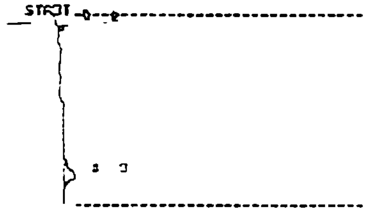


STOP 0 178.8
SAMPLE LIBRARY 1 JUN 29 1989 9:37
ANALYSIS # 18 0350-004-100
INTERNAL TEMP 28 PURGE
GAIN 20 8-8-10

COMPOUND NAME	PEAK	R.T.	AREA/PPM
STYRENE	3	125.8	5.560 PPM

PHOTOVAC

START

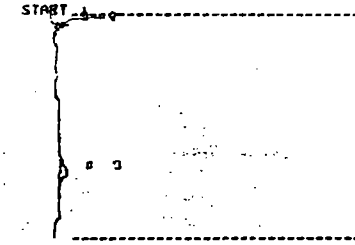


STOP 0 145.1
SAMPLE LIBRARY 1 JUN 29 1989 9:15
ANALYSIS # 14 0350-004-100
INTERNAL TEMP 29 PURGE
GAIN 20 8-8-5

COMPOUND NAME	PEAK	R.T.	AREA/PPM
STYRENE	3	127.8	1.027 PPM

PHOTOVAC

START

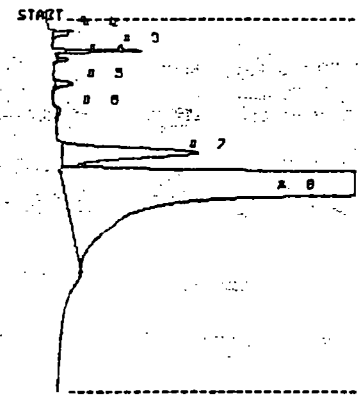


STOP 0 172.8
SAMPLE LIBRARY 1 JUN 29 1989 9:19
ANALYSIS # 15 0350-004-100
INTERNAL TEMP 29 PURGE
GAIN 20 8-8-5

COMPOUND NAME	PEAK	R.T.	AREA/PPM
STYRENE	3	127.2	733.8 PPB

PHOTOVAC

START



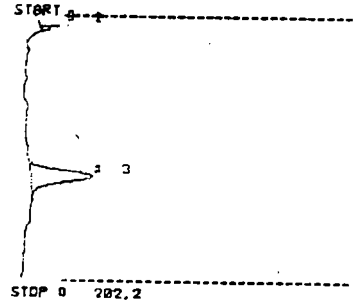
(8-8-5)

STOP 0 283.8
SAMPLE LIBRARY 1 JUN 29 1989 9:24
ANALYSIS # 16 0350-004-100
INTERNAL TEMP 29 SAMPLE
GAIN 20 8-8-5

COMPOUND NAME	PEAK	R.T.	AREA/PPM
BENZENE	3	24.4	1.455 PPM
TOLUENE	5	50.3	854.7 PPB
ETHYLBENZENE	7	105.9	18.53 PPM
STYRENE	8	126.5	288.1 PPM

PHOTOVAC

START

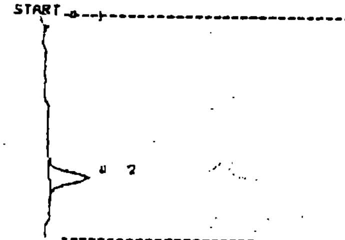


STOP 0 202.2
SAMPLE LIBRARY 1 JUN 29 1989 9: 8
ANALYSIS # 11 0350-004-100
INTERNAL TEMP 28 PURGE
GAIN 20 8-8-5

COMPOUND NAME	PEAK	R.T.	AREA/PPM
STYRENE	3	126.0	8.117 PPM

PHOTOVAC

START

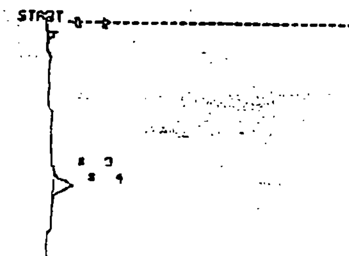


STOP 0 171.7
SAMPLE LIBRARY 1 JUN 29 1989 9: 3
ANALYSIS # 12 0350-004-100
INTERNAL TEMP 28 PURGE
GAIN 20 8-8-5

COMPOUND NAME	PEAK	R.T.	AREA/PPM
STYRENE	2	128.4	3.883 PPM

PHOTOVAC

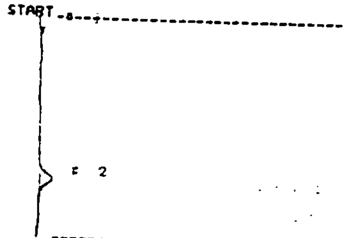
START



STOP 0 184.3
SAMPLE LIBRARY 1 JUN 29 1989 9:12
ANALYSIS # 13 0350-004-100
INTERNAL TEMP 29 PURGE
GAIN 20 8-8-5

COMPOUND NAME	PEAK	R.T.	AREA/PPM
STYRENE	4	128.4	1.443 PPM

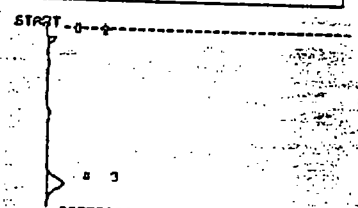
PHOTOVAC



STOP 0 168.9
SAMPLE LIBRARY 1 JUN 29 1989 10:21
ANALYSIS # 24 0350-004-100
INTERNAL TEMP 29 PURGE
GAIN 10 B-8-10

COMPOUND NAME	PEAK	R.T.	AREA/PPM
STYRENE	2	127.8	2.022 PPM

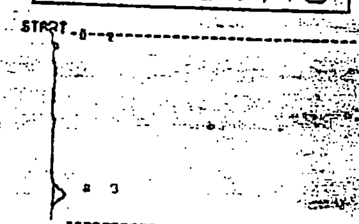
PHOTOVAC



STOP 0 138.8
SAMPLE LIBRARY 1 JUN 29 1989 10:24
ANALYSIS # 25 0359-004-100
INTERNAL TEMP 30 PURGE
GAIN 10 B-8-10

COMPOUND NAME	PEAK	R.T.	AREA/PPM
STYRENE	3	123.2	3.084 PPM

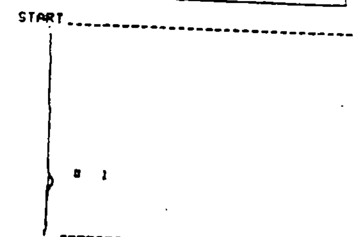
PHOTOVAC



STOP 0 144.8
SAMPLE LIBRARY 1 JUN 29 1989 10:27
ANALYSIS # 26 0359-004-100
INTERNAL TEMP 30 PURGE
GAIN 10 B-8-10

COMPOUND NAME	PEAK	R.T.	AREA/PPM
STYRENE	3	128.0	2.087 PPM

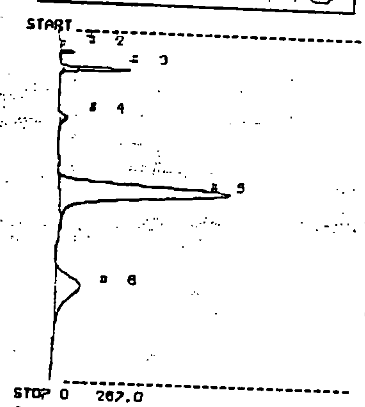
PHOTOVAC



STOP 0 163.4
SAMPLE LIBRARY 1 JUN 29 1989 10:14
ANALYSIS # 22 0359-004-100
INTERNAL TEMP 28 PURGE
GAIN 10 B-8-10

COMPOUND NAME PEAK R.T. AREA/PPM

PHOTOVAC

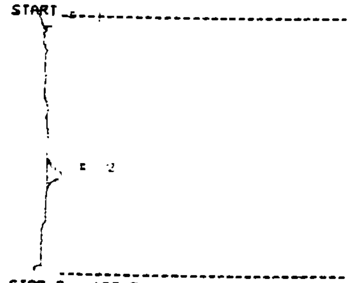


(B-8-15)

STOP 0 267.0
SAMPLE LIBRARY 1 JUN 29 1989 10:15
ANALYSIS # 23 0359-004-100
INTERNAL TEMP 29 SAMPLE
GAIN 10 B-8-15

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	3	23.7	463.1 mVS
STYRENE	5	124.4	38.57 PPM
UNKNOWN	6	190.2	1.9 VS

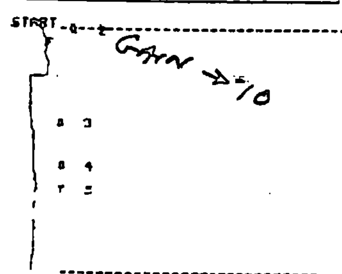
PHOTOVAC



STOP 0 197.8
SAMPLE LIBRARY 1 JUN 29 1989 3:41
ANALYSIS # 19 0350-004-100
INTERNAL TEMP 29 PURGE
GAIN 20 B-8-10

COMPOUND NAME	PEAK	R.T.	AREA/PPM
STYRENE	2	128.0	1.496 PPM

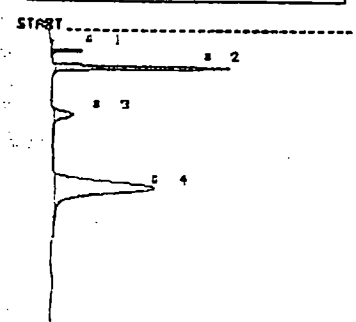
PHOTOVAC



STOP 0 171.8
SAMPLE LIBRARY 1 JUN 29 1989 3:45
ANALYSIS # 20 0359-004-100
INTERNAL TEMP 29 PURGE
GAIN 10 B-8-10

COMPOUND NAME PEAK R.T. AREA/PPM

PHOTOVAC



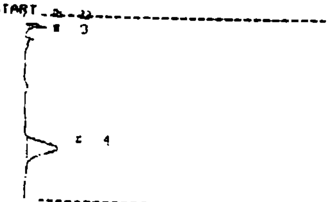
(B-8-20)

STOP 0 225.8
SAMPLE LIBRARY 1 JUN 29 1989 3:50
ANALYSIS # 21 0359-004-100
INTERNAL TEMP 29 SAMPLE
GAIN 10 B-8-20

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	17.0	104.9 mVS
UNKNOWN	2	23.8	1.3 VS
UNKNOWN	3	87.1	340.2 mVS
STYRENE	4	123.8	20.44 PPM

PHOTOVAC

START



STOP 0 142.4
SAMPLE LIBRARY 1 JUN 23 1989 11:38
ANALYSIS # 42 0350-004-100
INTERNAL TEMP 32 SAMPLE STND
GAIN 10 5PPM STYRENE

COMPOUND NAME PEAK R.T. AREA/PPM

ETHYLBENZENE 4 105.4 5.249 PPM

PHOTOVAC

CALIBRATED PEAK 4,STYRENE

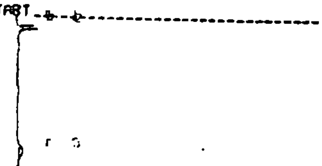
SAMPLE LIBRARY 1 JUN 23 1989 11:30
ANALYSIS # 42 0350-004-100
INTERNAL TEMP 32 SAMPLE STND
GAIN 10 5PPM STYRENE

COMPOUND NAME PEAK R.T. AREA/PPM

STYRENE 4 105.4 5.000 PPM

PHOTOVAC

START

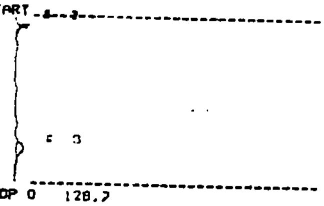


STOP 0 118.8
SAMPLE LIBRARY 1 JUN 23 1989 11:34
ANALYSIS # 43 0350-004-100
INTERNAL TEMP 32 PURGE STND
GAIN 10 5PPM STYRENE

COMPOUND NAME PEAK R.T. AREA/PPM

PHOTOVAC

START



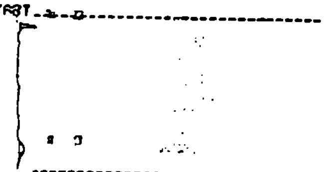
STOP 0 128.7
SAMPLE LIBRARY 1 JUN 23 1989 11:20
ANALYSIS # 39 0350-004-100
INTERNAL TEMP 32 PURGE STND
GAIN 10 5PPM STYRENE

COMPOUND NAME PEAK R.T. AREA/PPM

ETHYLBENZENE 3 104.5 303.8 PPB

PHOTOVAC

START



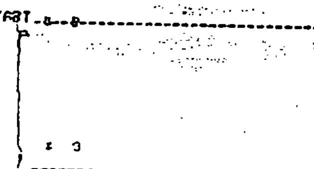
STOP 0 113.2
SAMPLE LIBRARY 1 JUN 23 1989 11:23
ANALYSIS # 40 0350-004-100
INTERNAL TEMP 32 PURGE STND
GAIN 10 5PPM STYRENE

COMPOUND NAME PEAK R.T. AREA/PPM

ETHYLBENZENE 3 105.7 583.2 PPB

PHOTOVAC

START

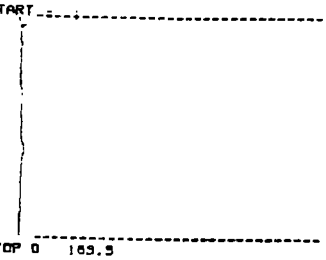


STOP 0 112.7
SAMPLE LIBRARY 1 JUN 23 1989 11:27
ANALYSIS # 41 0350-004-100
INTERNAL TEMP 32 PURGE STND
GAIN 10 5PPM STYRENE

COMPOUND NAME PEAK R.T. AREA/PPM

PHOTOVAC

START

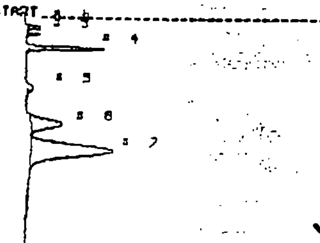


STOP 0 163.5
SAMPLE LIBRARY 1 JUN 23 1989 11:08
ANALYSIS # 36 0350-004-100
INTERNAL TEMP 31 PURGE
GAIN 10 B-5-10

COMPOUND NAME PEAK R.T. AREA/PPM

PHOTOVAC

START



(B-9-10)

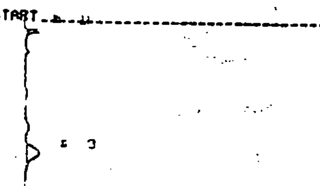
STOP 0 174.2
SAMPLE LIBRARY 1 JUN 23 1989 11:15
ANALYSIS # 37 0350-004-100
INTERNAL TEMP 32 SAMPLE
GAIN 10 B-5-10

COMPOUND NAME PEAK R.T. AREA/PPM

BENZENE 4 24.5 3.262 PPM
UNKNOWN 6 84.7 784.7 mVS
ETHYLBENZENE 7 104.5 13.77 PPM

PHOTOVAC

START



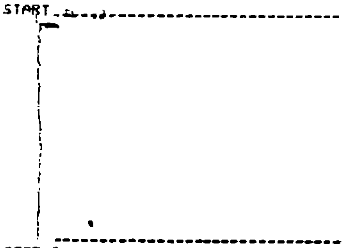
STOP 0 130.4
SAMPLE LIBRARY 1 JUN 23 1989 11:18
ANALYSIS # 38 0350-004-100
INTERNAL TEMP 31 PURGE STND
GAIN 10 5PPM STYRENE

COMPOUND NAME PEAK R.T. AREA/PPM

ETHYLBENZENE 3 104.5 2.033 PPM

PHOTOVAC

START

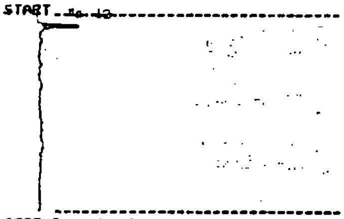


STOP 0 171.9
SAMPLE LIBRARY 1 JUN 29 1989 11:34
ANALYSIS # 48 0350-004-100
INTERNAL TEMP 32 PURGE
GAIN 10 B-5-15

COMPOUND NAME PEAK R.T. AREA/PPM

PHOTOVAC

START

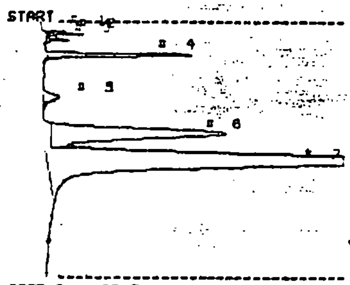


STOP 0 151.9
SAMPLE LIBRARY 1 JUN 29 1989 11:57
ANALYSIS # 45 0350-004-100
INTERNAL TEMP 31 SAMPLE
GAIN 10 AMBIANT AIR

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	2	9.9	112.8 mVS

PHOTOVAC

START



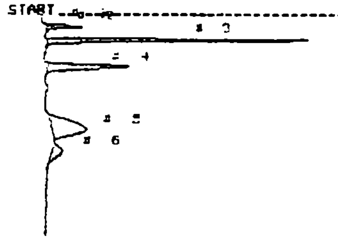
STOP 0 193.2
SAMPLE LIBRARY 1 JUN 29 1989 12: 2
ANALYSIS # 50 0350-004-100
INTERNAL TEMP 31 SAMPLE
GAIN 10 B-5-15

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	4	25.0	984.4 mVS
UNKNOWN	5	58.3	223.2 mVS
ETHYLBENZENE	6	88.0	34.41 PPM
STYRENE	7	108.0	138.8 PPM

(B-9-15)

PHOTOVAC

START



CALIBRATED PEAK 3,BENZENE

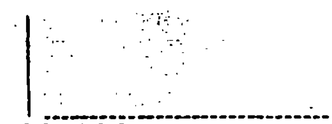
SAMPLE LIBRARY 1 JUN 29 1989 11:46
ANALYSIS # 46 0350-004-100
INTERNAL TEMP 32 SAMPLE STND
GAIN 10 BTX

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	2	10.2	123.4 mVS
BENZENE	3	20.3	10.20 PPM
TOLUENE	4	41.7	9.222 PPM
ETHYLBENZENE	5	91.6	7.386 PPM
STYRENE	6	108.4	1.693 PPM

CALIBRATED PEAK 4,TOLUENE

SAMPLE LIBRARY 1 JUN 29 1989 11:48
ANALYSIS # 46 0350-004-100
INTERNAL TEMP 31 SAMPLE STND
GAIN 10 BTX

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	2	10.2	123.4 mVS
BENZENE	3	20.3	11.72 PPM
TOLUENE	4	41.7	10.69 PPM
ETHYLBENZENE	5	91.6	8.490 PPM
STYRENE	6	108.4	1.946 PPM

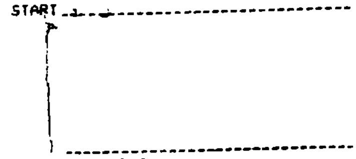


STOP 0 287.8
SAMPLE LIBRARY 1 JUN 29 1989 11:49
ANALYSIS # 47 0350-004-100
INTERNAL TEMP 31 SAMPLE STND
GAIN 10 BTX

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	2	10.2	123.4 mVS
BENZENE	3	20.3	11.72 PPM
TOLUENE	4	41.7	10.69 PPM
ETHYLBENZENE	5	91.6	8.490 PPM
STYRENE	6	108.4	1.946 PPM

PHOTOVAC

START

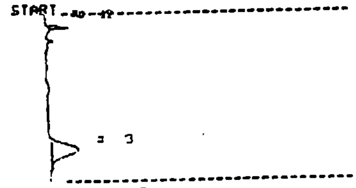


STOP 0 187.2
SAMPLE LIBRARY 1 JUN 29 1989 11:38
ANALYSIS # 44 0350-004-100
INTERNAL TEMP 32 PURGE STND
GAIN 10 5PPM STYRENE

COMPOUND NAME PEAK R.T. AREA/PPM

PHOTOVAC

START

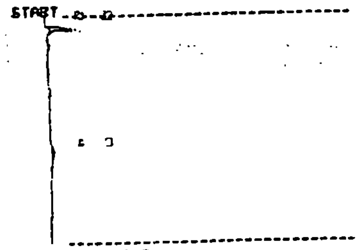


STOP 0 125.5
SAMPLE LIBRARY 1 JUN 29 1989 11:39
ANALYSIS # 45 0350-004-100
INTERNAL TEMP 33 SAMPLE STND
GAIN 10 5PPM STYRENE

COMPOUND NAME	PEAK	R.T.	AREA/PPM
STYRENE	3	108.9	4.330 PPM

PHOTOVAC

START



STOP 0 172.2
SAMPLE LIBRARY 1 JUN 29 1989 11:43
ANALYSIS # 46 0350-004-100
INTERNAL TEMP 32 PURGE STND
GAIN 10 BTX

COMPOUND NAME PEAK R.T. AREA/PPM

PHOTOVAC

CALIBRATED PEAK 3,BENZENE

SAMPLE LIBRARY 1 JUN 23 1989 14:22
ANALYSIS # 20 0350-004-100
INTERNAL TEMP 26 SAMPLE STND
GAIN 10 BTX

COMPOUND NAME	PEAK	R.T.	AREA/PPM
BENZENE	3	20.1	10.20 PPM
TOLUENE	4	41.3	10.38 PPM
ETHYLBENZENE	5	51.8	11.28 PPM
STYRENE	6	108.1	5.503 PPM

PHOTOVAC

CALIBRATED PEAK 4,TOLUENE

SAMPLE LIBRARY 1 JUN 23 1989 14:22
ANALYSIS # 20 0350-004-100
INTERNAL TEMP 37 SAMPLE STND
GAIN 10 BTX

COMPOUND NAME	PEAK	R.T.	AREA/PPM
BENZENE	3	20.1	10.40 PPM
TOLUENE	4	41.3	10.80 PPM
ETHYLBENZENE	5	51.8	11.51 PPM
STYRENE	6	108.1	5.677 PPM

PHOTOVAC

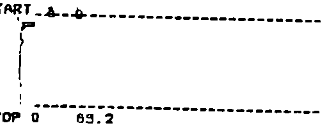
CALIBRATED PEAK 5,ETHYLBENZENE

SAMPLE LIBRARY 1 JUN 23 1989 14:23
ANALYSIS # 20 0350-004-100
INTERNAL TEMP 26 SAMPLE STND
GAIN 10 BTX

COMPOUND NAME	PEAK	R.T.	AREA/PPM
BENZENE	3	20.1	9.943 PPM
TOLUENE	4	41.3	10.12 PPM
ETHYLBENZENE	5	51.8	11.00 PPM
STYRENE	6	108.1	5.424 PPM

PHOTOVAC

START

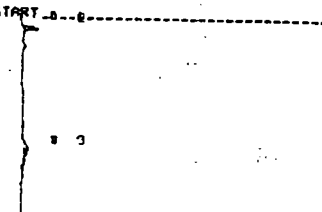


STOP 0 89.2
SAMPLE LIBRARY 1 JUN 23 1989 14:15
ANALYSIS # 18 0350-004-100
INTERNAL TEMP 37 PURGE STND
GAIN 10 BTX

COMPOUND NAME PEAK R.T. AREA/PPM

PHOTOVAC

START

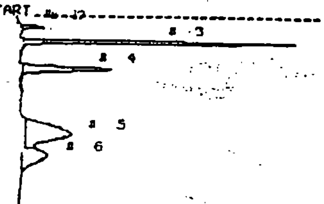


STOP 0 157.0
SAMPLE LIBRARY 1 JUN 23 1989 14:15
ANALYSIS # 19 0350-004-100
INTERNAL TEMP 37 PURGE STND
GAIN 10 BTX

COMPOUND NAME PEAK R.T. AREA/PPM

PHOTOVAC

START

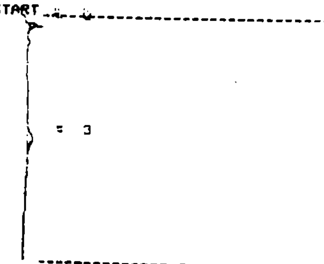


STOP 0 148.9
SAMPLE LIBRARY 1 JUN 23 1989 14:22
ANALYSIS # 20 0350-004-100
INTERNAL TEMP 37 SAMPLE STND
GAIN 10 BTX

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	3	20.1	1.4 US
UNKNOWN	4	41.3	1.0 US
STYRENE	5	51.0	2.734 PPM
STYRENE	6	108.1	3.343 PPM

PHOTOVAC

START

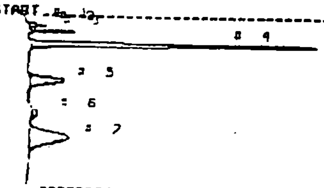


STOP 0 100.5
SAMPLE LIBRARY 1 JUN 23 1989 14:7
ANALYSIS # 15 0350-004-100
INTERNAL TEMP 37 PURGE
GAIN 10 B-9-20

COMPOUND NAME PEAK R.T. AREA/PPM

PHOTOVAC

START



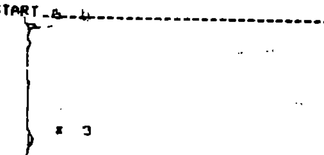
(B-9-20)

STOP 0 132.5
SAMPLE LIBRARY 1 JUN 23 1989 14:10
ANALYSIS # 16 0350-004-100
INTERNAL TEMP 37 SAMPLE
GAIN 10 B-9-20

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	3	13.5	147.7 mUS
UNKNOWN	4	23.1	1.5 US
UNKNOWN	5	52.3	567.2 mUS
ETHYLBENZENE	6	77.1	393.8 PPB
STYRENE	7	96.4	4.674 PPM

PHOTOVAC

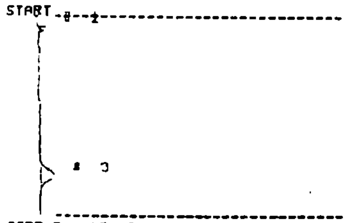
START



STOP 0 105.6
SAMPLE LIBRARY 1 JUN 23 1989 14:13
ANALYSIS # 17 0350-004-100
INTERNAL TEMP 37 PURGE STND
GAIN 10 BTX

COMPOUND NAME	PEAK	R.T.	AREA/PPM
STYRENE	3	96.2	422.5 PPB

PHOTOVAC

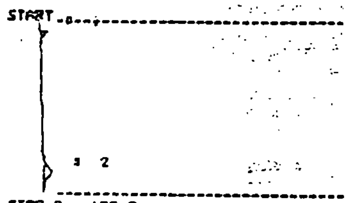


STOP 0 151.8
SAMPLE LIBRARY 1 JUN 23 1989 10:34
ANALYSIS # 33 0350-004-100
INTERNAL TEMP 31 PURGE
GAIN 10 B-9-5

COMPOUND NAME PEAK R.T. AREA/PPM

STYRENE 3 124.4 2.472 PPM

PHOTOVAC

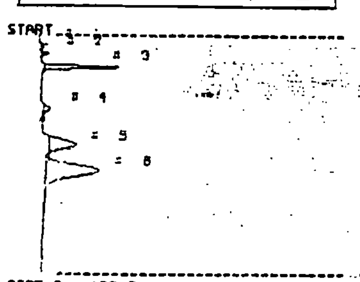


STOP 0 133.8
SAMPLE LIBRARY 1 JUN 23 1989 10:57
ANALYSIS # 34 0350-004-100
INTERNAL TEMP 31 PURGE
GAIN 10 B-9-5

COMPOUND NAME PEAK R.T. AREA/PPM

ETHYLBENZENE 2 128.4 552.8 PPB

PHOTOVAC



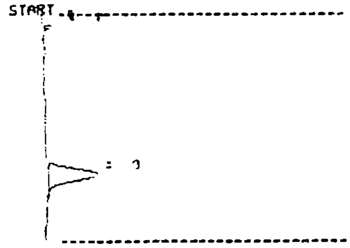
STOP 0 180.2
SAMPLE LIBRARY 1 JUN 23 1989 11:2
ANALYSIS # 35 0350-004-100
INTERNAL TEMP 31 SAMPLE
GAIN 10 B-9-5

COMPOUND NAME PEAK R.T. AREA/PPM

BENZENE 3 25.3 3.152 PPM
UNKNOWN 5 84.7 782.0 mVS
ETHYLBENZENE 6 104.9 8.039 PPM

(B-9-5)

PHOTOVAC

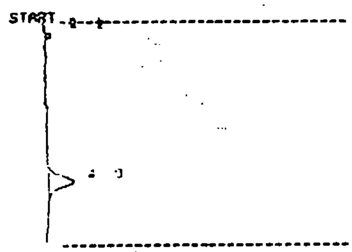


STOP 0 173.2
SAMPLE LIBRARY 1 JUN 23 1989 10:45
ANALYSIS # 30 0350-004-100
INTERNAL TEMP 30 PURGE
GAIN 10 B-9-5

COMPOUND NAME PEAK R.T. AREA/PPM

STYRENE 3 125.2 10.25 PPM

PHOTOVAC

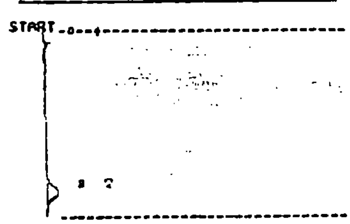


STOP 0 171.7
SAMPLE LIBRARY 1 JUN 23 1989 10:48
ANALYSIS # 31 0350-004-100
INTERNAL TEMP 30 PURGE
GAIN 10 B-9-5

COMPOUND NAME PEAK R.T. AREA/PPM

STYRENE 3 128.8 4.681 PPM

PHOTOVAC

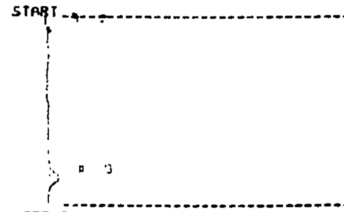


STOP 0 140.5
SAMPLE LIBRARY 1 JUN 23 1989 10:51
ANALYSIS # 32 0350-004-100
INTERNAL TEMP 31 PURGE
GAIN 10 B-9-5

COMPOUND NAME PEAK R.T. AREA/PPM

STYRENE 2 125.8 1.519 PPM

PHOTOVAC

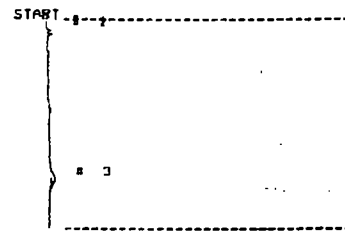


STOP 0 143.2
SAMPLE LIBRARY 1 JUN 23 1989 10:30
ANALYSIS # 27 0350-004-100
INTERNAL TEMP 31 PURGE
GAIN 10 B-8-10

COMPOUND NAME PEAK R.T. AREA/PPM

STYRENE 3 126.4 1.466 PPM

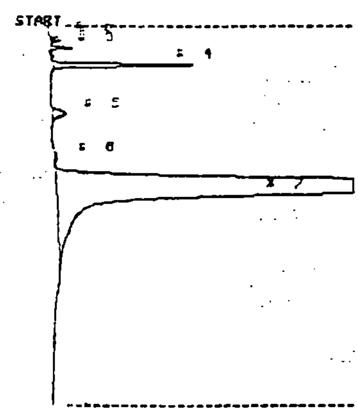
PHOTOVAC



STOP 0 161.8
SAMPLE LIBRARY 1 JUN 23 1989 10:34
ANALYSIS # 28 0350-004-100
INTERNAL TEMP 31 PURGE
GAIN 10 B-8-10

COMPOUND NAME PEAK R.T. AREA/PPM

PHOTOVAC



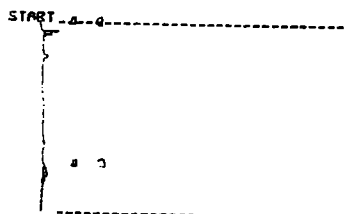
STOP 0 288.5
SAMPLE LIBRARY 1 JUN 23 1989 10:40
ANALYSIS # 23 0350-004-100
INTERNAL TEMP 29 ~~PURGE~~ SAMPLE
GAIN 10 B-8-10

COMPOUND NAME PEAK R.T. AREA/PPM

UNKNOWN 4 39.1 1.0 VS
UNKNOWN 5 68.3 213.4 mVS
STYRENE 7 123.8 225.8 PPM

(B-8-10)

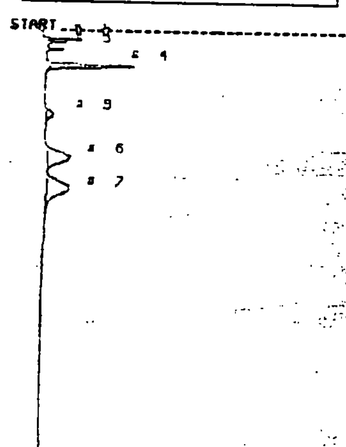
PHOTOVAC



STOP 0 142.4
SAMPLE LIBRARY 1 JUN 23 1989 14:48
ANALYSIS # 27 0350-004-100
INTERNAL TEMP 37 PURGE
GAIN 10 B-10-15

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	3	118.6	114.3 mVS

PHOTOVAC

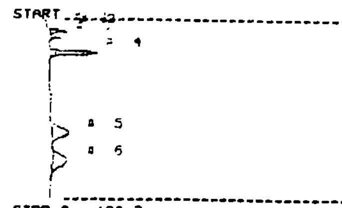


(B-10-15)

STOP 0 328.1
SAMPLE LIBRARY 1 JUN 23 1989 14:54
ANALYSIS # 28 0350-004-100
INTERNAL TEMP 38 SAMPLE
GAIN 10 B-10-15

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	4	28.0	828.0 mVS
STYRENE	6	93.7	2.343 PPM
UNKNOWN	7	124.4	703.1 mVS

PHOTOVAC

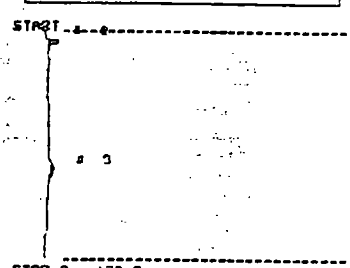


STOP 0 136.2
SAMPLE LIBRARY 1 JUN 23 1989 14:36
ANALYSIS # 24 0350-004-100
INTERNAL TEMP 36 SAMPLE
GAIN 10 B-10-5

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	4	23.9	231.0 mVS
ETHYLBENZENE	5	88.3	1.575 PPM
STYRENE	6	109.3	1.347 PPM

(B-10-5)

PHOTOVAC

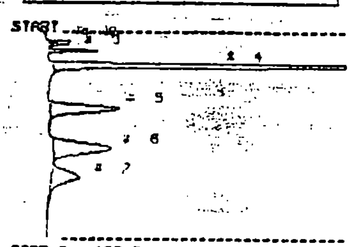


STOP 0 176.2
SAMPLE LIBRARY 1 JUN 23 1989 14:40
ANALYSIS # 25 0350-004-100
INTERNAL TEMP 36 PURGE
GAIN 10 B-10-10

COMPOUND NAME PEAK R.T. AREA/PPM

(B-10-20)

PHOTOVAC

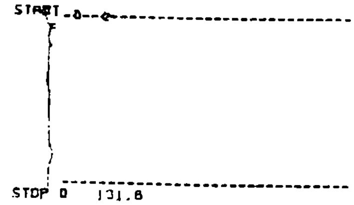


(B-10-10)

STOP 0 157.8
SAMPLE LIBRARY 1 JUN 23 1989 14:44
ANALYSIS # 26 0350-004-100
INTERNAL TEMP 36 SAMPLE
GAIN 10 B-10-10

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	3	15.0	183.2 mVS
UNKNOWN	4	26.0	4.4 VS
UNKNOWN	5	68.3	1.2 VS
ETHYLBENZENE	6	93.7	6.357 PPM
STYRENE	7	113.2	3.713 PPM

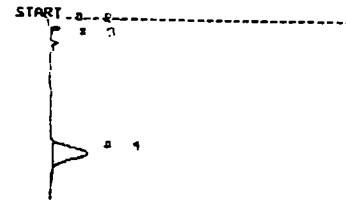
PHOTOVAC



STOP 0 131.8
SAMPLE LIBRARY 1 JUN 23 1989 14:26
ANALYSIS # 21 0350-004-100
INTERNAL TEMP 35 PURGE STND
GAIN 10 5PPM STYRENE

COMPOUND NAME PEAK R.T. AREA/PPM

PHOTOVAC



CALIBRATED PEAK 4, STYRENE

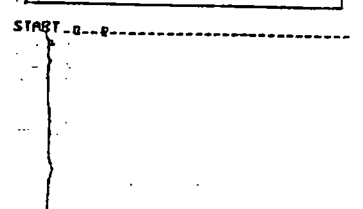
SAMPLE LIBRARY 1 JUN 23 1989 14:29
ANALYSIS # 21 0350-004-100
INTERNAL TEMP 36 SAMPLE STND
GAIN 10 5PPM STYRENE

COMPOUND NAME	PEAK	R.T.	AREA/PPM
STYRENE	4	108.8	5.000 PPM

STOP 0 142.9
SAMPLE LIBRARY 1 JUN 23 1989 14:29
ANALYSIS # 22 0350-004-100
INTERNAL TEMP 36 SAMPLE STND
GAIN 10 5PPM STYRENE

COMPOUND NAME	PEAK	R.T.	AREA/PPM
STYRENE	4	108.6	5.000 PPM

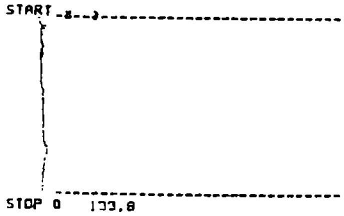
PHOTOVAC



STOP 0 138.5
SAMPLE LIBRARY 1 JUN 23 1989 14:32
ANALYSIS # 23 0350-004-100
INTERNAL TEMP 36 PURGE
GAIN 10 B-10-5

COMPOUND NAME PEAK R.T. AREA/PPM

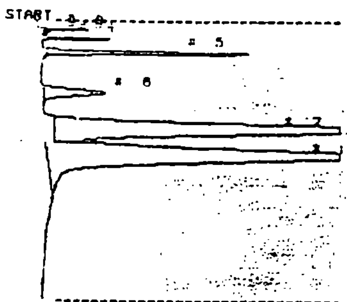
PHOTOVAC



STOP 0 133.8
SAMPLE LIBRARY 1 JUN 29 1989 16: 1
ANALYSIS # 34 0350-004-100
INTERNAL TEMP 40 PURGE
GAIN 10 B-11-5

COMPOUND NAME PEAK R.T. AREA/PPM

PHOTOVAC

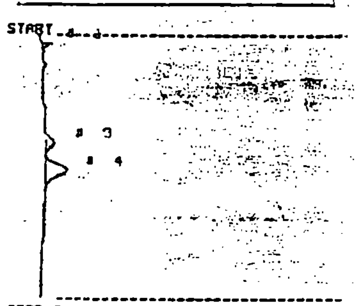


STOP 0 214.5
SAMPLE LIBRARY 1 JUN 29 1989 16: 5
ANALYSIS # 35 0350-004-100
INTERNAL TEMP 40 SAMPLE
GAIN 10 B-11-5

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	4	14.5	283.1 mVS
UNKNOWN	5	25.1	1.4 VS
UNKNOWN	6	58.9	1.0 VS
ETHYLBENZENE	7	84.1	45.78 PPM
STYRENE	8	104.1	81.64 PPM

(B-11-5)

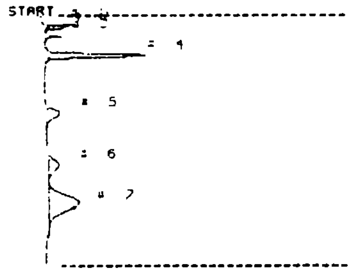
PHOTOVAC



STOP 0 139.3
SAMPLE LIBRARY 1 JUN 29 1989 16:11
ANALYSIS # 36 0350-004-100
INTERNAL TEMP 40 PURGE
GAIN 10 B-11-10

COMPOUND NAME	PEAK	R.T.	AREA/PPM
ETHYLBENZENE	3	89.3	609.5 PPB
STYRENE	4	109.4	2.899 PPM

PHOTOVAC

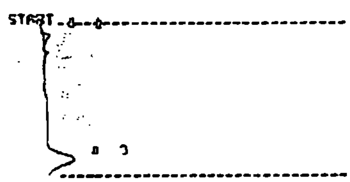


STOP 0 191.8
SAMPLE LIBRARY 1 JUN 29 1989 15:16
ANALYSIS # 31 0350-004-100
INTERNAL TEMP 37 ~~PURGE~~ Sample
GAIN 10 B-10-20

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	4	31.8	851.5 mVS
UNKNOWN	5	76.7	251.3 mVS
STYRENE	6	116.8	1.441 PPM
UNKNOWN	7	142.2	1.3 VS

(B-10-20)

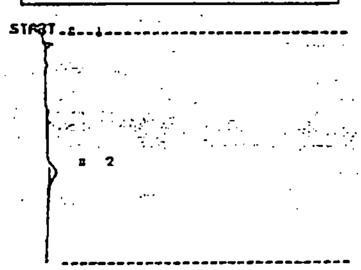
PHOTOVAC



STOP 0 117.8
SAMPLE LIBRARY 1 JUN 29 1989 15:55
ANALYSIS # 32 0350-004-100
INTERNAL TEMP 38 PURGE
GAIN 10 B-11-5

COMPOUND NAME PEAK R.T. AREA/PPM

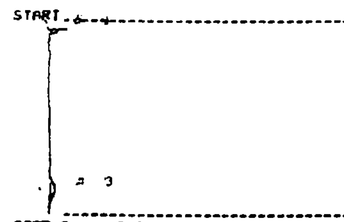
PHOTOVAC



STOP 0 174.8
SAMPLE LIBRARY 1 JUN 29 1989 15:58
ANALYSIS # 33 0350-004-100
INTERNAL TEMP 38 PURGE
GAIN 10 B-11-5

COMPOUND NAME	PEAK	R.T.	AREA/PPM
STYRENE	2	107.8	356.8 PPB

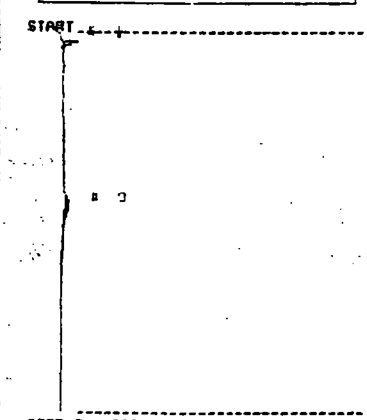
PHOTOVAC



STOP 0 147.5
SAMPLE LIBRARY 1 JUN 29 1989 14:57
ANALYSIS # 23 0350-004-100
INTERNAL TEMP 37 PURGE
GAIN 10 B-10-20

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	3	132.8	148.2 mVS

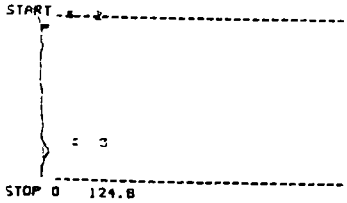
PHOTOVAC



STOP 0 230.3
SAMPLE LIBRARY 1 JUN 29 1989 15: 5
ANALYSIS # 26 0350-004-100
INTERNAL TEMP 38 PURGE
GAIN 10 B-10-20

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	3	138.4	137.8 mVS

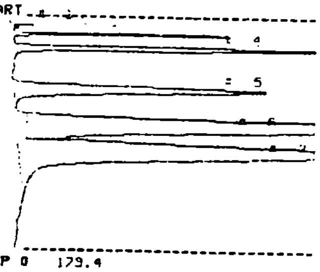
PHOTOVAC



STOP 0 124.8
SAMPLE LIBRARY 1 JUN 23 1989 16:??
ANALYSIS # 43 0350-004-100
INTERNAL TEMP 40 PURGE
GAIN 10 B-11-15

COMPOUND NAME	PEAK	R.T.	AREA/PPM
STYRENE	3	106.8	882.0 PPB

PHOTOVAC

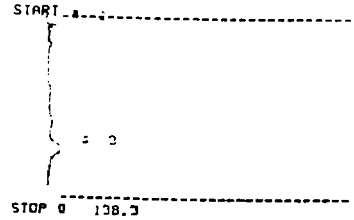


STOP 0 179.4
SAMPLE LIBRARY 1 JUN 23 1989 16:??
ANALYSIS # 40 0350-004-100
INTERNAL TEMP 41 SAMPLE
GAIN 10 B-11-10

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	3	14.8	895.3 mVS
UNKNOWN	4	25.0	3.2 VS
UNKNOWN	5	37.7	4.4 VS
ETHYLBENZENE	6	84.9	76.33 PPM
STYRENE	7	105.4	93.05 PPM

(B-11-10)

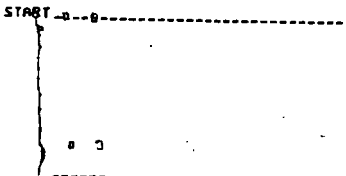
PHOTOVAC



STOP 0 138.3
SAMPLE LIBRARY 1 JUN 23 1989 16:13
ANALYSIS # 37 0350-004-100
INTERNAL TEMP 41 PURGE
GAIN 10 B-11-10

COMPOUND NAME	PEAK	R.T.	AREA/PPM
STYRENE	3	105.1	1.289 PPM

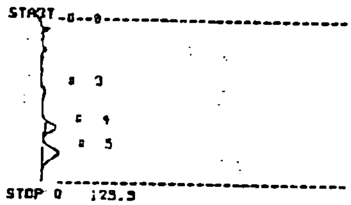
PHOTOVAC



STOP 0 122.3
SAMPLE LIBRARY 1 JUN 23 1989 16:36
ANALYSIS # 44 0350-004-100
INTERNAL TEMP 40 PURGE
GAIN 10 B-11-15

COMPOUND NAME PEAK R.T. AREA/PPM

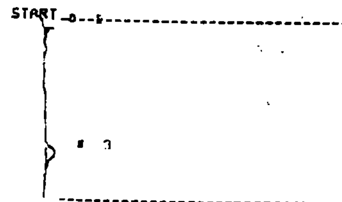
PHOTOVAC



STOP 0 125.3
SAMPLE LIBRARY 1 JUN 23 1989 16:?6
ANALYSIS # 41 0350-004-100
INTERNAL TEMP 40 ~~SAMPLE~~ PURGE
GAIN 10 B-11-~~10~~ 15

COMPOUND NAME	PEAK	R.T.	AREA/PPM
ETHYLBENZENE	4	85.9	1.020 PPM
STYRENE	5	106.8	2.054 PPM

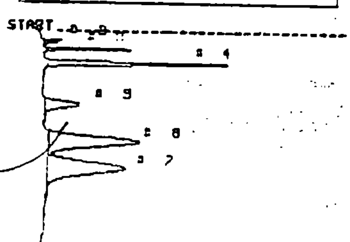
PHOTOVAC



STOP 0 138.8
SAMPLE LIBRARY 1 JUN 23 1989 16:16
ANALYSIS # 38 0350-004-100
INTERNAL TEMP 41 PURGE
GAIN 10 B-11-10

COMPOUND NAME	PEAK	R.T.	AREA/PPM
STYRENE	3	105.4	1.037 PPM

PHOTOVAC

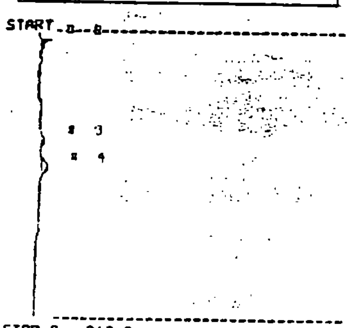


STOP 0 108.8
SAMPLE LIBRARY 1 JUN 23 1989 16:39
ANALYSIS # 45 0350-004-100
INTERNAL TEMP 40 SAMPLE
GAIN 10 B-11-15

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	3	14.8	288.9 mVS
UNKNOWN	4	25.4	1.2 VS
UNKNOWN	5	37.7	330.0 mVS
ETHYLBENZENE	6	88.2	3.351 PPM
STYRENE	7	108.6	11.81 PPM

(B-11-15)

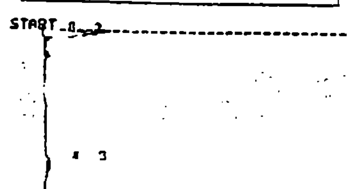
PHOTOVAC



STOP 0 217.9
SAMPLE LIBRARY 1 JUN 23 1989 16:29
ANALYSIS # 42 0350-004-100
INTERNAL TEMP 40 PURGE
GAIN 10 B-11-15

COMPOUND NAME	PEAK	R.T.	AREA/PPM
STYRENE	4	105.7	651.2 PPB

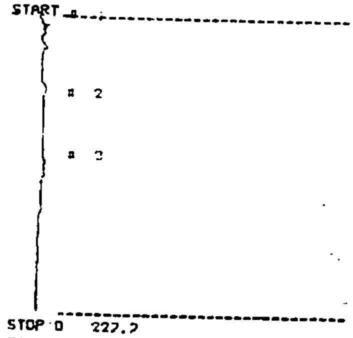
PHOTOVAC



STOP 0 124.8
SAMPLE LIBRARY 1 JUN 23 1989 16:10
ANALYSIS # 39 0350-004-100
INTERNAL TEMP 42 PURGE
GAIN 10 B-11-10

COMPOUND NAME PEAK R.T. AREA/PPM

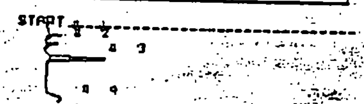
PHOTOVAC



STOP 0 227.2
SAMPLE LIBRARY 1 JUN 27 1989 11:55
ANALYSIS # 15 0350-004-100
INTERNAL TEMP 30 PURGE
GAIN 20 B1-15

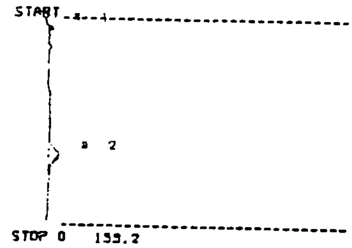
COMPOUND NAME PEAK R.T. AREA/PPM

PHOTOVAC



JUN 27 1989 12:29
INTERNAL BATTERIES LOW, POWER OFF
AC OPERATION REQUIRED

PHOTOVAC

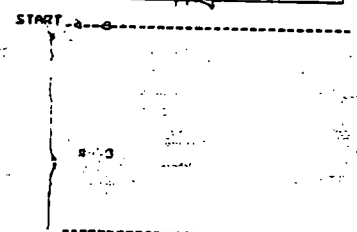


STOP 0 133.2
SAMPLE LIBRARY 1 JUN 29 1989 16:59
ANALYSIS # 48 0350-004-100
INTERNAL TEMP 30 PURGE
GAIN 10 B-11-20

COMPOUND NAME PEAK R.T. AREA/PPM

STYRENE 2 107.2 1.188 PPM

PHOTOVAC



STOP 0 137.8
SAMPLE LIBRARY 1 JUN 29 1989 17: 2
ANALYSIS # 49 0350-004-100
INTERNAL TEMP 30 PURGE
GAIN 10 B-11-20

COMPOUND NAME PEAK R.T. AREA/PPM

(B-11-20)

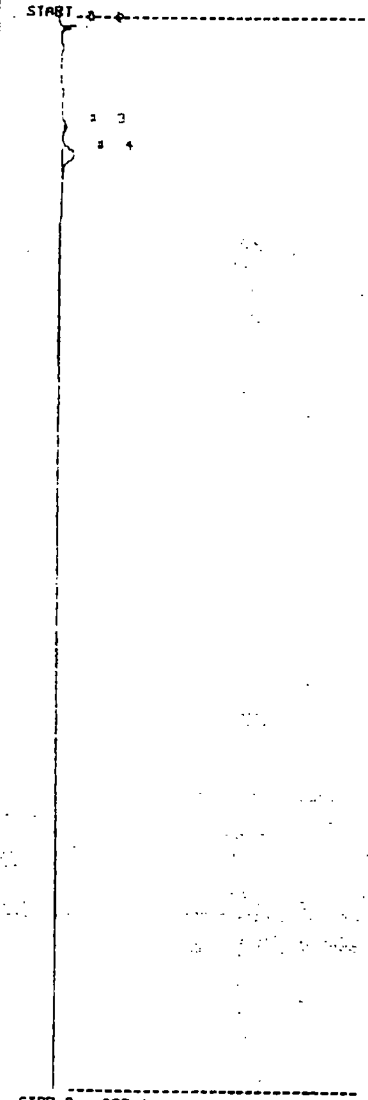
PHOTOVAC

START

STOP 0 12.6
SAMPLE LIBRARY 1 JUN 29 1989 16:41
ANALYSIS # 46 0350-004-100
INTERNAL TEMP 35 SAMPLE
GAIN 10 B-11-15

COMPOUND NAME PEAK R.T. AREA/PPM

PHOTOVAC



STOP 0 822.1
SAMPLE LIBRARY 1 JUN 29 1989 16:55
ANALYSIS # 47 0350-004-100
INTERNAL TEMP 32 PURGE
GAIN 10 B-11-20

COMPOUND NAME PEAK R.T. AREA/PPM

STYRENE 4 109.3 1.401 PPM

PHOTOVAC

CALIBRATED PEAK 4.TOLUENE

SAMPLE LIBRARY 1 JUN 30 1989 8:10
ANALYSIS # 9 0350-004-100
INTERNAL TEMP 30 SAMPLE STND
GAIN 10 BTX

COMPOUND NAME	PEAK	R.T.	AREA/PPM
BENZENE	3	15.1	12.05 PPM
TOLUENE	4	38.7	10.68 PPM
ETHYLBENZENE	5	87.4	10.32 PPM
STYRENE	6	103.9	4.071 PPM

PHOTOVAC

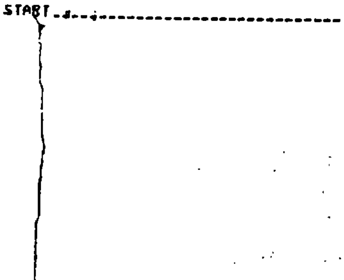
CALIBRATED PEAK 5.ETHYLBENZENE

SAMPLE LIBRARY 1 JUN 30 1989 8:16
ANALYSIS # 8 0350-004-100
INTERNAL TEMP 31 SAMPLE STND
GAIN 10 BTX

COMPOUND NAME	PEAK	R.T.	AREA/PPM
BENZENE	3	15.1	12.78 PPM
TOLUENE	4	38.7	11.24 PPM
ETHYLBENZENE	5	87.4	11.00 PPM
STYRENE	6	103.9	4.318 PPM

PHOTOVAC

START

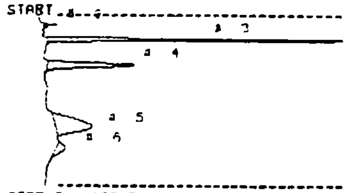


STOP 0 208.7
SAMPLE LIBRARY 1 JUN 30 1989 8:23
ANALYSIS # 3 0350-004-100
INTERNAL TEMP 30 PURGE STND
GAIN 10 BTX

COMPOUND NAME PEAK R.T. AREA/PPM

PHOTOVAC

START

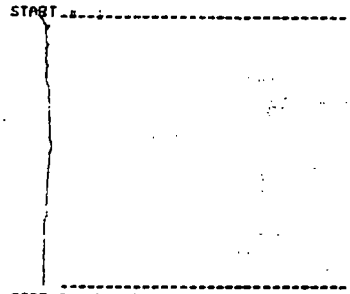


STOP 0 129.5
SAMPLE LIBRARY 1 JUN 30 1989 8:26
ANALYSIS # 10 0350-004-100
INTERNAL TEMP 31 ~~SAMPLE~~ STND
GAIN 10 BTX Sample

COMPOUND NAME	PEAK	R.T.	AREA/PPM
BENZENE	3	15.2	12.61 PPM
TOLUENE	4	38.7	11.21 PPM
ETHYLBENZENE	5	87.4	9.235 PPM
STYRENE	6	103.8	1.927 PPM

PHOTOVAC

START

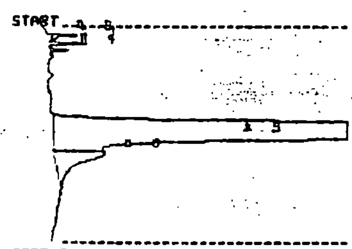


STOP 0 208.5
SAMPLE LIBRARY 1 JUN 30 1989 8:30
ANALYSIS # 11 0350-004-100
INTERNAL TEMP 31 PURGE STND
GAIN 10 5PPM STYRENE

COMPOUND NAME PEAK R.T. AREA/PPM

PHOTOVAC

START



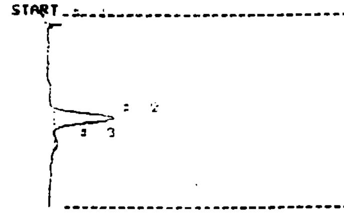
STOP 0 164.8
SAMPLE LIBRARY 1 JUN 30 1989 8:48
ANALYSIS # 12 0350-004-100
INTERNAL TEMP 30 SAMPLE
GAIN 10 B-12-5

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	3	14.2	121.6 mVS
ETHYLBENZENE	5	81.3	323.8 PPM
STYRENE	6	100.0	13.52 PPM

(B-12-5)

PHOTOVAC

START

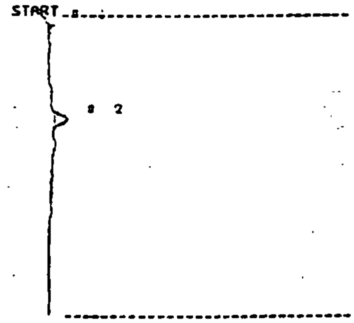


STOP 0 147.3
SAMPLE LIBRARY 1 JUN 30 1989 8:52
ANALYSIS # 13 0350-004-100
INTERNAL TEMP 30 PURGE
GAIN 10 B-12-10

COMPOUND NAME	PEAK	R.T.	AREA/PPM
ETHYLBENZENE	2	82.8	10.83 PPM

PHOTOVAC

START

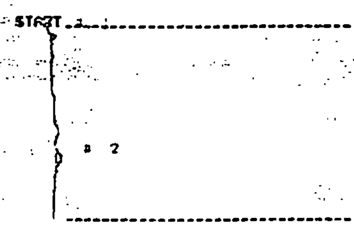


STOP 0 231.8
SAMPLE LIBRARY 1 JUN 30 1989 8:58
ANALYSIS # 14 0350-004-100
INTERNAL TEMP 31 PURGE
GAIN 10 B-12-10

COMPOUND NAME	PEAK	R.T.	AREA/PPM
ETHYLBENZENE	2	81.7	2.101 PPM

PHOTOVAC

START

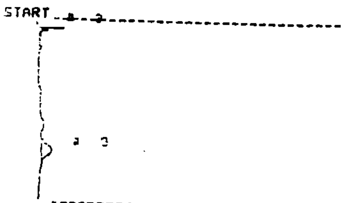


STOP 0 146.7
SAMPLE LIBRARY 1 JUN 30 1989 9:11
ANALYSIS # 15 0350-004-100
INTERNAL TEMP 32 PURGE
GAIN 10 B-12-10

COMPOUND NAME	PEAK	R.T.	AREA/PPM
STYRENE	2-	102.7	356.8 PPB

PHOTOVAC

START

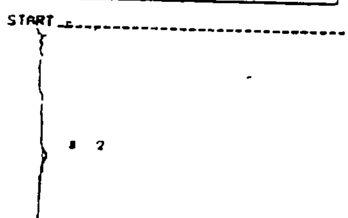


STOP 0 139.6
SAMPLE LIBRARY 1 JUN 30 1989 9:16
ANALYSIS # 16 0350-004-100
INTERNAL TEMP 33 PURGE
GAIN 10 B-12-10

COMPOUND NAME	PEAK	R.T.	AREA/PPM
STYRENE	3	102.7	2.032 PPM

PHOTOVAC

START

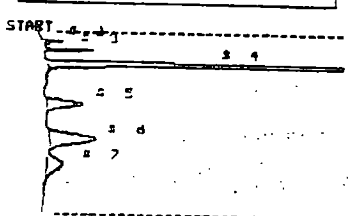


STOP 0 150.8
SAMPLE LIBRARY 1 JUN 30 1989 9:18
ANALYSIS # 17 0350-004-100
INTERNAL TEMP 34 PURGE
GAIN 10 B-12-10

COMPOUND NAME PEAK R.T. AREA/PPM

PHOTOVAC

START



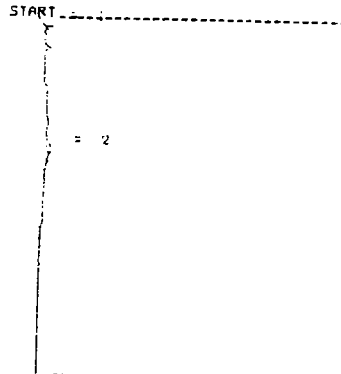
STOP 0 137.4
SAMPLE LIBRARY 1 JUN 30 1989 9:22
ANALYSIS # 18 0350-004-100
INTERNAL TEMP 34 SAMPLE
GAIN 10 B-12-10

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	3	14.2	153.3 mUS
UNKNOWN	4	24.2	4.0 US
UNKNOWN	5	55.5	608.1 mUS
ETHYLBENZENE	6	82.5	8.125 PPM
STYRENE	7	102.4	3.035 PPM

(B-12-10)

PHOTOVAC

START

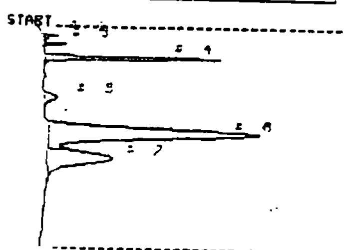


STOP 0 275.8
SAMPLE LIBRARY 1 JUN 30 1989 9:28
ANALYSIS # 19 0350-004-100
INTERNAL TEMP 34 PURGE
GAIN 10 B-12-15

COMPOUND NAME PEAK R.T. AREA/PPM

PHOTOVAC

START



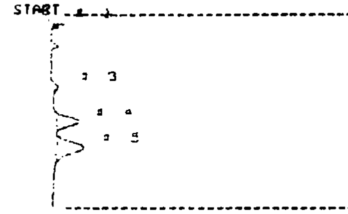
STOP 0 170.1
SAMPLE LIBRARY 1 JUN 30 1989 9:53
ANALYSIS # 20 0350-004-100
INTERNAL TEMP 33 SAMPLE
GAIN 10 B-12-15

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	4	24.7	1.1 US
UNKNOWN	5	56.1	192.2 mUS
ETHYLBENZENE	6	83.5	40.33 PPM
STYRENE	7	103.0	17.26 PPM

(B-12-15)

PHOTOVAC

START

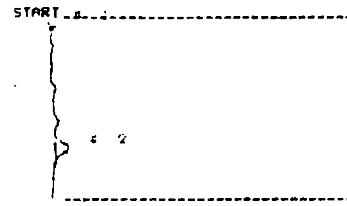


STOP 0 147.5
SAMPLE LIBRARY 1 JUN 30 1989 9:57
ANALYSIS # 21 0350-004-100
INTERNAL TEMP 34 PURGE
GAIN 10 B-12-20

COMPOUND NAME	PEAK	R.T.	AREA/PPM
ETHYLBENZENE	4	83.5	3.499 PPM
STYRENE	5	103.0	6.523 PPM

PHOTOVAC

START

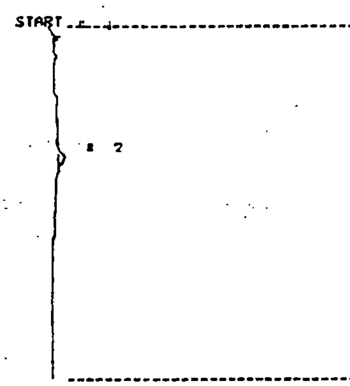


STOP 0 133.2
SAMPLE LIBRARY 1 JUN 30 1989 10:0
ANALYSIS # 22 0350-004-100
INTERNAL TEMP 34 PURGE
GAIN 10 B-12-20

COMPOUND NAME	PEAK	R.T.	AREA/PPM
STYRENE	2	102.7	2.579 PPM

PHOTOVAC

START

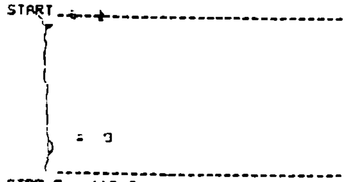


STOP 0 263.8
SAMPLE LIBRARY 1 JUN 30 1989 10:13
ANALYSIS # 23 0350-004-100
INTERNAL TEMP 33 PURGE
GAIN 10 B-12-20

COMPOUND NAME	PEAK	R.T.	AREA/PPM
STYRENE	2	102.4	1.320 PPM

PHOTOVAC

START

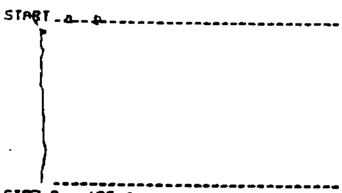


STOP 0 118.9
SAMPLE LIBRARY 1 JUN 30 1989 10:16
ANALYSIS # 24 0350-004-100
INTERNAL TEMP 33 PURGE
GAIN 10 B-12-20

COMPOUND NAME	PEAK	R.T.	AREA/PPM
STYRENE	3	103.0	984.9 PPB

PHOTOVAC

START

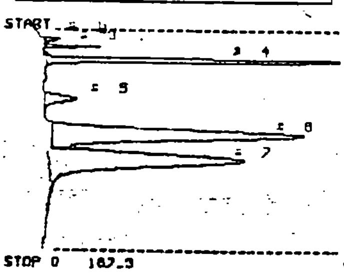


STOP 0 125.4
SAMPLE LIBRARY 1 JUN 30 1989 10:20
ANALYSIS # 25 0350-004-100
INTERNAL TEMP 34 PURGE
GAIN 10 B-12-20

COMPOUND NAME	PEAK	R.T.	AREA/PPM

PHOTOVAC

START



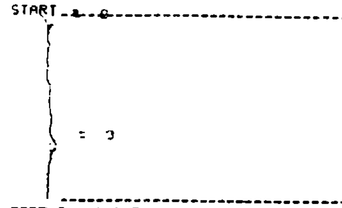
STOP 0 167.3
SAMPLE LIBRARY 1 JUN 30 1989 10:24
ANALYSIS # 26 0350-004-100
INTERNAL TEMP 34 ~~PURGE~~ SAMPLE
GAIN 10 B-12-20

(B-10-20)

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	3	14.1	171.8 mUS
UNKNOWN	4	24.8	3.4 US
UNKNOWN	5	55.3	514.6 mUS
ETHYLBENZENE	6	82.3	49.05 PPM
STYRENE	7	102.1	51.74 PPM

PHOTOVAC

START

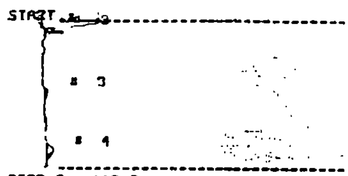


STOP 0 141.8
SAMPLE LIBRARY 1 JUN 30 1989 10:31
ANALYSIS # 27 0350-004-100
INTERNAL TEMP 34 PURGE
GAIN 10 B-13-5

COMPOUND NAME	PEAK	R.T.	AREA/PPM
STYRENE	3	101.0	876.8 PPB

PHOTOVAC

START

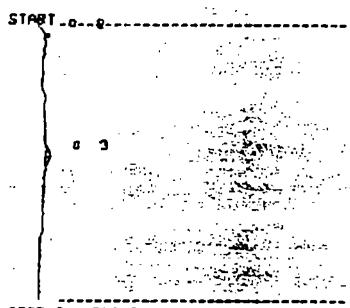


STOP 0 113.8
SAMPLE LIBRARY 1 JUN 30 1989 10:33
ANALYSIS # 28 0350-004-100
INTERNAL TEMP 35 PURGE
GAIN 10 B-13-5

COMPOUND NAME	PEAK	R.T.	AREA/PPM
STYRENE	4	102.4	1.405 PPM

PHOTOVAC

START

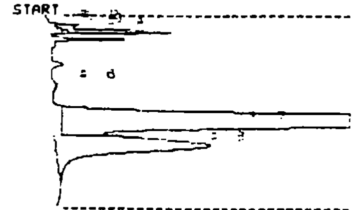


STOP 0 208.8
SAMPLE LIBRARY 1 JUN 30 1989 10:37
ANALYSIS # 29 0350-004-100
INTERNAL TEMP 35 PURGE
GAIN 10 B-13-5

COMPOUND NAME	PEAK	R.T.	AREA/PPM

PHOTOVAC

START



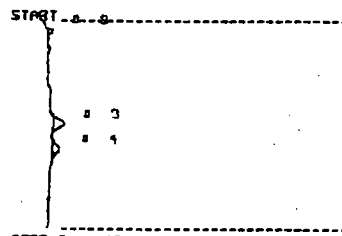
STOP 0 146.8
SAMPLE LIBRARY 1 JUN 30 1989 10:40
ANALYSIS # 30 0350-004-100
INTERNAL TEMP 36 SAMPLE
GAIN 10 B-13-5

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	3	12.1	239.4 mUS
UNKNOWN	4	14.2	432.7 mUS
BENZENE	5	19.4	2.739 PPM
ETHYLBENZENE	7	81.9	185.5 PPM
STYRENE	8	101.8	42.01 PPM

(B-13-5)

PHOTOVAC

START

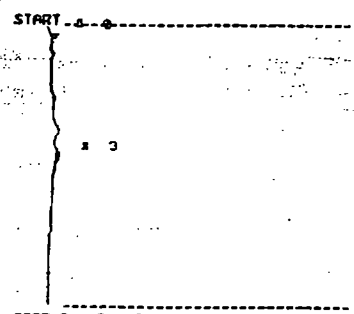


STOP 0 160.4
SAMPLE LIBRARY 1 JUN 30 1989 10:57
ANALYSIS # 31 0350-004-100
INTERNAL TEMP 36 PURGE
GAIN 10 B-13-10

COMPOUND NAME	PEAK	R.T.	AREA/PPM
ETHYLBENZENE	3	82.6	1.561 PPM
STYRENE	4	102.1	1.308 PPM

PHOTOVAC

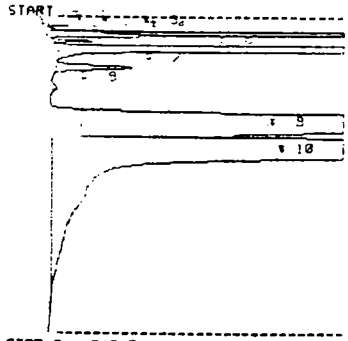
START



STOP 0 214.2
SAMPLE LIBRARY 1 JUN 30 1989 10:52
ANALYSIS # 32 0350-004-100
INTERNAL TEMP 35 PURGE
GAIN 10 B-13-10

COMPOUND NAME	PEAK	R.T.	AREA/PPM

PHOTOVAC

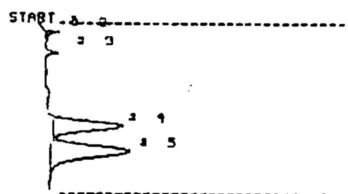


STOP 0 240.5
SAMPLE LIBRARY 1 JUN 30 1989 11:12
ANALYSIS # 33 0350-004-100
INTERNAL TEMP 35 SAMPLE
GAIN 10 B-13-10

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	3	12.1	1.1 US
UNKNOWN	4	14.3	2.0 US
BENZENE	5	19.7	1.200 PPM
UNKNOWN	6	24.5	7.4 US
TOLUENE	7	35.2	3.242 PPM
ETHYLBENZENE	9	82.1	330.6 PPM
STYRENE	10	101.2	349.2 PPM

(B-13-10)

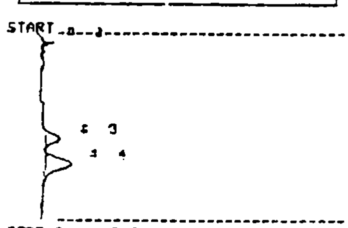
PHOTOVAC



STOP 0 131.1
SAMPLE LIBRARY 1 JUN 30 1989 11:21
ANALYSIS # 34 0350-004-100
INTERNAL TEMP 36 PURGE
GAIN 10 B-13-15

COMPOUND NAME	PEAK	R.T.	AREA/PPM
ETHYLBENZENE	4	82.3	12.65 PPM
STYRENE	5	101.8	13.58 PPM

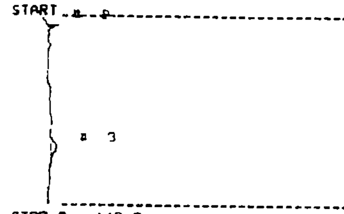
PHOTOVAC



STOP 0 142.6
SAMPLE LIBRARY 1 JUN 30 1989 11:24
ANALYSIS # 35 0350-004-100
INTERNAL TEMP 37 PURGE
GAIN 10 B-13-15

COMPOUND NAME	PEAK	R.T.	AREA/PPM
ETHYLBENZENE	3	82.3	2.020 PPM
STYRENE	4	102.1	6.257 PPM

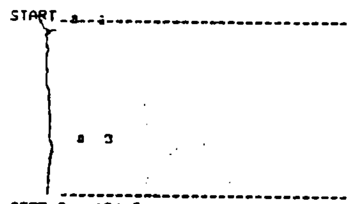
PHOTOVAC



STOP 0 143.6
SAMPLE LIBRARY 1 JUN 30 1989 11:25
ANALYSIS # 36 0350-004-100
INTERNAL TEMP 37 PURGE
GAIN 10 B-13-15

COMPOUND NAME	PEAK	R.T.	AREA/PPM
STYRENE	3	101.8	981.1 PPB

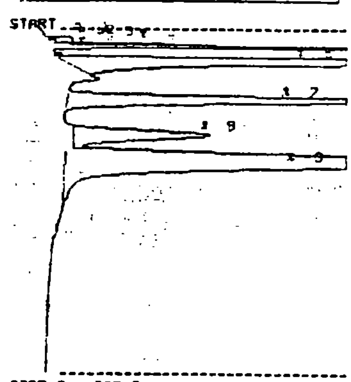
PHOTOVAC



STOP 0 134.5
SAMPLE LIBRARY 1 JUN 30 1989 11:32
ANALYSIS # 37 0350-004-100
INTERNAL TEMP 37 PURGE
GAIN 10 B-13-15

COMPOUND NAME PEAK R.T. AREA/PPM

PHOTOVAC

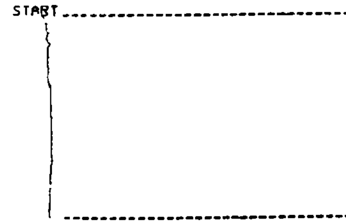


STOP 0 260.5
SAMPLE LIBRARY 1 JUN 30 1989 11:36
ANALYSIS # 38 0350-004-100
INTERNAL TEMP 37 SAMPLE
GAIN 10 B-13-15

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	3	12.0	323.8 mUS
UNKNOWN	4	14.9	2.2 US
UNKNOWN	6	24.8	12.9 US
UNKNOWN	7	34.5	7.3 US
ETHYLBENZENE	8	82.0	25.05 PPM
STYRENE	9	101.2	189.5 PPM

(B-13-15)

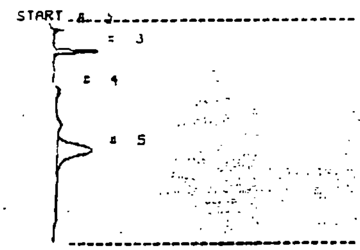
PHOTOVAC



STOP 0 154.0
SAMPLE LIBRARY 1 JUN 30 1989 11:42
ANALYSIS # 39 0350-004-100
INTERNAL TEMP 38 PURGE
GAIN 10 B-13-20

COMPOUND NAME PEAK R.T. AREA/PPM

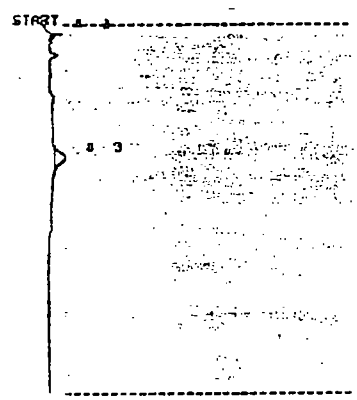
PHOTOVAC



STOP 0 171.8
SAMPLE LIBRARY 1 JUN 30 1989 11:45
ANALYSIS # 40 0350-004-100
INTERNAL TEMP 37 PURGE
GAIN 10 B-13-20

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	3	24.3	258.3 mUS
STYRENE	5	102.1	8.113 PPM

PHOTOVAC

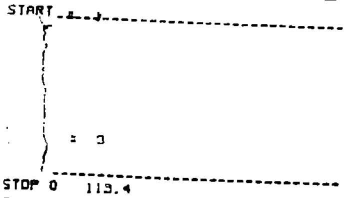


STOP 0 278.5
SAMPLE LIBRARY 1 JUN 30 1989 11:51
ANALYSIS # 41 0350-004-100
INTERNAL TEMP 37 PURGE
GAIN 10 B-13-20

COMPOUND NAME	PEAK	R.T.	AREA/PPM
STYRENE	3	102.4	2.400 PPM

PHOTOVAC

START



STOP 0 113.4
SAMPLE LIBRARY 1 JUN 30 1989 11:55
ANALYSIS # 12 0350-004-100
INTERNAL TEMP 38 PURGE
GAIN 10 B-13-20

COMPOUND NAME PEAK R.T. AREA/PPM

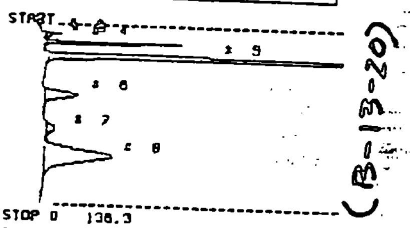
PHOTOVAC

START

JUN 30 1989 12: 1
INTERNAL BATTERIES LOW, POWER OFF
AC OPERATION REQUIRED

PHOTOVAC

START



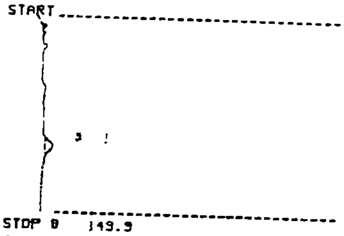
(B-13-20)

STOP 0 138.3
SAMPLE LIBRARY 1 JUN 30 1989 12: 7
ANALYSIS # 1 0350-004-100
INTERNAL TEMP 37 ~~PURGE~~ SAMPLE
GAIN 10 B-13-20

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	4	14.3	423.5 mVS
UNKNOWN	5	24.2	3.8 VS
UNKNOWN	6	55.3	342.7 mVS
ETHYLBENZENE	7	82.6	1.188 PPM
STYRENE	8	102.1	16.57 PPM

PHOTOVAC

START

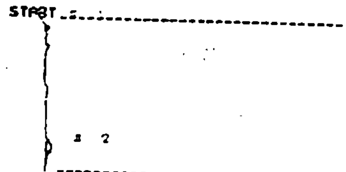


STOP 0 149.9
SAMPLE LIBRARY 1 JUN 30 1989 12:02
ANALYSIS # 2 0350-004-100
INTERNAL TEMP 35 PURGE
GAIN 10 B-13-20

COMPOUND NAME	PEAK	R.T.	AREA/PPM
STYRENE	1	102.1	1.569 PPM

PHOTOVAC

START

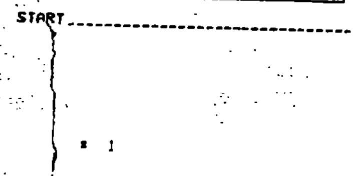


STOP 0 118.2
SAMPLE LIBRARY 1 JUN 30 1989 12:24
ANALYSIS # 3 0350-004-100
INTERNAL TEMP 36 PURGE
GAIN 10 B-13-20

COMPOUND NAME	PEAK	R.T.	AREA/PPM
STYRENE	2	102.1	877.4 PPB

PHOTOVAC

START

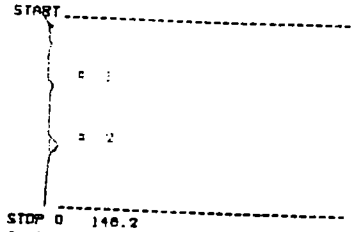


STOP 0 115.1
SAMPLE LIBRARY 1 JUN 30 1989 12:27
ANALYSIS # 4 0350-004-100
INTERNAL TEMP 36 PURGE
GAIN 10 B-13-20

COMPOUND NAME PEAK R.T. AREA/PPM

PHOTOVAC

START

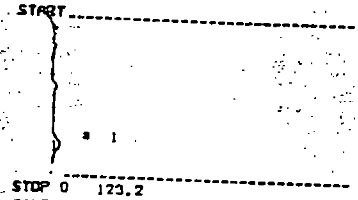


STOP 0 148.2
SAMPLE LIBRARY 1 JUN 30 1989 12:32
ANALYSIS # 5 0350-004-100
INTERNAL TEMP 36 PURGE
GAIN 10 B-13-20

COMPOUND NAME	PEAK	R.T.	AREA/PPM
STYRENE	2	102.1	1.642 PPM

PHOTOVAC

START

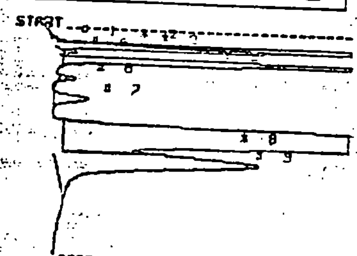


STOP 0 123.2
SAMPLE LIBRARY 1 JUN 30 1989 12:40
ANALYSIS # 6 0350-004-100
INTERNAL TEMP 36 PURGE
GAIN 10 B-13-20

COMPOUND NAME	PEAK	R.T.	AREA/PPM
STYRENE	1	101.5	1.130 PPM

PHOTOVAC

START



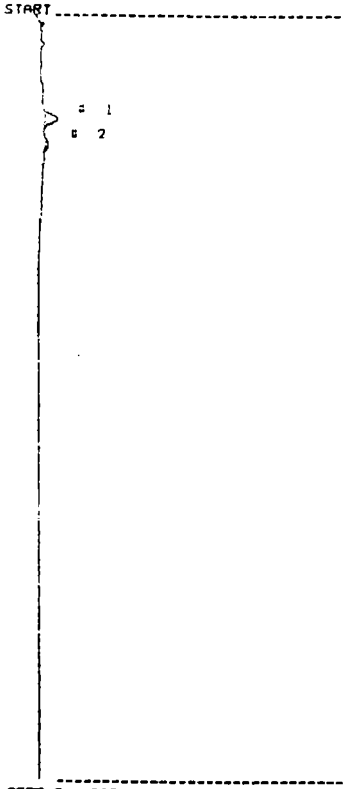
(B-14-10)

STOP 0 173.8
SAMPLE LIBRARY 1 JUN 30 1989 12:45
ANALYSIS # 7 0350-004-100
INTERNAL TEMP 36 SAMPLE
GAIN 10 B-14-10

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	2	12.3	335.5 mVS
UNKNOWN	3	14.4	2.5 VS
UNKNOWN	5	24.4	5.6 VS
TOLUENE	6	39.3	1.736 PPM
UNKNOWN	7	55.5	565.8 mVS
ETHYLBENZENE	8	82.1	234.9 PPM
STYRENE	9	102.1	57.12 PPM

PHOTOVAC

START

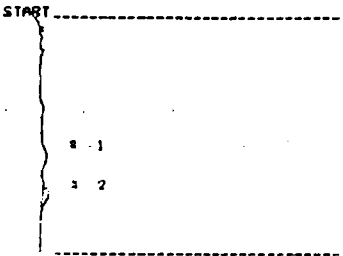


STOP 0 388.1
SAMPLE LIBRARY 1 JUN 30 1989 12:57
ANALYSIS # 9 0350-004-100
INTERNAL TEMP 35 PURGE
GAIN 10 B-14-5

COMPOUND NAME	PEAK	R.T.	AREA/PPM
ETHYLBENZENE	1	81.7	1.735 PPM

PHOTOVAC

START

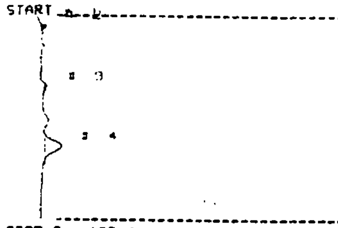


STOP 0 178.1
SAMPLE LIBRARY 1 JUN 30 1989 13: 0
ANALYSIS # 9 0350-004-100
INTERNAL TEMP 36 PURGE
GAIN 10 B-14-5

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	2	137.2	223.1 mUS

PHOTOVAC

START

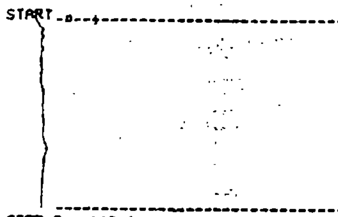


STOP 0 155.4
SAMPLE LIBRARY 1 JUN 30 1989 13: 8
ANALYSIS # 10 0350-004-100
INTERNAL TEMP 36 PURGE
GAIN 10 B-14-5

COMPOUND NAME	PEAK	R.T.	AREA/PPM
STYRENE	4	102.4	3.715 PPM

PHOTOVAC

START

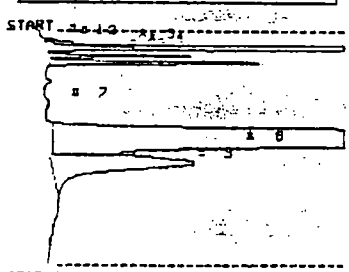


STOP 0 146.1
SAMPLE LIBRARY 1 JUN 30 1989 13:11
ANALYSIS # 11 0350-004-100
INTERNAL TEMP 37 PURGE
GAIN 10 B-14-5

COMPOUND NAME PEAK R.T. AREA/PPM

PHOTOVAC

START



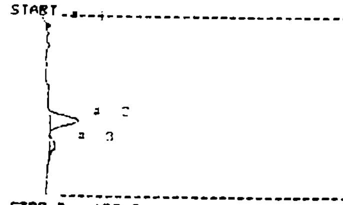
(B-14-5)

STOP 0 176.0
SAMPLE LIBRARY 1 JUN 30 1989 13:14
ANALYSIS # 12 0350-004-100
INTERNAL TEMP 37 SAMPLE
GAIN 10 B-14-5

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	2	9.3	113.5 mUS
UNKNOWN	3	12.0	1.0 US
UNKNOWN	4	14.0	1.0 US
BENZENE	5	19.9	9.494 PPM
UNKNOWN	6	24.3	1.3 US
ETHYLBENZENE	8	81.3	321.4 PPM
STYRENE	9	102.1	40.73 PPM

PHOTOVAC

START

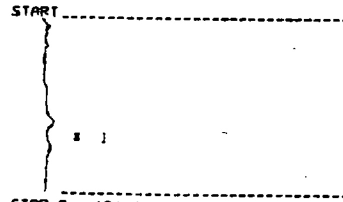


STOP 0 137.6
SAMPLE LIBRARY 1 JUN 30 1989 13:18
ANALYSIS # 13 0350-004-100
INTERNAL TEMP 32 PURGE
GAIN 10 B-14-15

COMPOUND NAME	PEAK	R.T.	AREA/PPM
ETHYLBENZENE	2	82.0	4.850 PPM
STYRENE	3	101.8	567.1 PPB

PHOTOVAC

START

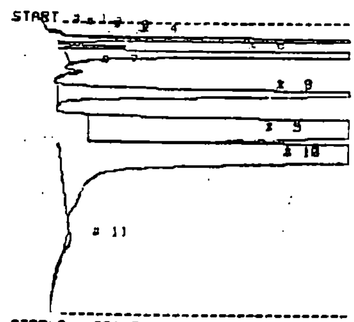


STOP 0 134.4
SAMPLE LIBRARY 1 JUN 30 1989 13:20
ANALYSIS # 14 0350-004-100
INTERNAL TEMP 30 PURGE
GAIN 12 B-14-15

COMPOUND NAME PEAK R.T. AREA/PPM

PHOTOVAC

START



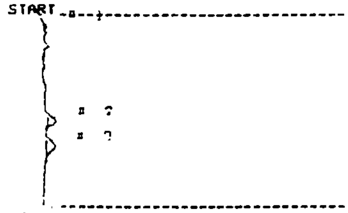
(B-14-15)

STOP 0 221.9
SAMPLE LIBRARY 1 JUN 30 1989 13:24
ANALYSIS # 15 0350-004-100
INTERNAL TEMP 32 SAMPLE
GAIN 10 B-14-15

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	3	11.3	561.3 mUS
UNKNOWN	4	13.9	2.5 US
BENZENE	5	19.3	2.176 PPM
UNKNOWN	6	24.2	3.7 US
TOLUENE	7	38.0	1.374 PPM
UNKNOWN	8	54.5	8.4 US
ETHYLBENZENE	9	81.9	342.7 PPM
STYRENE	10	101.8	[illegible]

PHOTOVAC

START

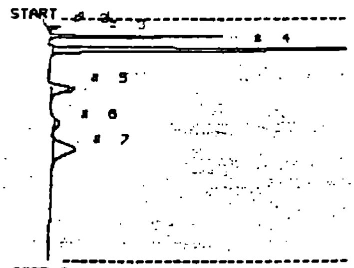


STOP 0 145.5
SAMPLE LIBRARY 1 JUN 30 1989 13:27
ANALYSIS # 16 8350-004-1PP
INTERNAL TEMP 38 PURGE
GAIN 10 B-14-20

COMPOUND NAME	PEAK	R.T.	AREA/PPM
ETHYLBENZENE	2	82.5	1.245 PPM
STYRENE	3	182.4	1.704 PPM

PHOTOVAC

START



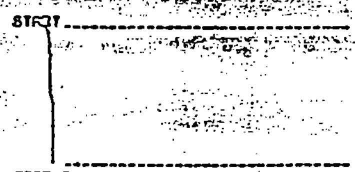
(B-14-20)

STOP 0 184.0
SAMPLE LIBRARY 1 JUN 30 1989 13:43
ANALYSIS # 17 8350-004-1PP
INTERNAL TEMP 38 ~~PURGE~~ SAMPLE
GAIN 10 B-14-20

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	3	14.2	571.0 mVS
UNKNOWN	4	24.1	2.8 VS
UNKNOWN	5	55.3	369.0 mVS
STYRENE	7	182.1	4.811 PPM

PHOTOVAC

START

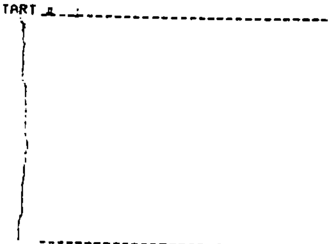


STOP 0 183.9
SAMPLE LIBRARY 1 JUN 30 1989 13:45
ANALYSIS # 18 8350-004-1PB
INTERNAL TEMP 37 PURGE
GAIN 10 B-14-20

COMPOUND NAME PEAK R.T. AREA/PPM

PHOTOVAC

START # 1

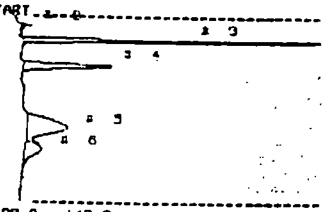


STOP 0 173.8
SAMPLE LIBRARY 1 JUN 30 1989 8:13
ANALYSIS # 7 0330-004-100
INTERNAL TEMP 30 PURGE STND
GAIN 10 BTX

COMPOUND NAME	PEAK	R.T.	AREA/PPM

PHOTOVAC

START # 0



STOP 0 142.2
SAMPLE LIBRARY 1 JUN 30 1989 8:16
ANALYSIS # 8 0330-004-100
INTERNAL TEMP 31 SAMPLE STND
GAIN 10 BTX

COMPOUND NAME	PEAK	R.T.	AREA/PPM
BENZENE	3	19.1	8.338 PPM
UNKNOWN	4	38.7	1.0 VS
ETHYLBENZENE	5	87.4	2.785 PPM
ETHYLBENZENE	6	103.9	2.852 PPM

PHOTOVAC

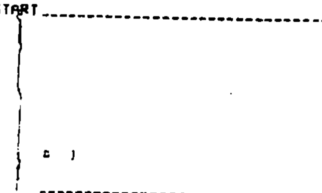
CALIBRATED PEAK 3,BENZENE

SAMPLE LIBRARY 1 JUN 30 1989 8:16
ANALYSIS # 6 0330-004-100
INTERNAL TEMP 31 SAMPLE STND
GAIN 10 BTX

COMPOUND NAME	PEAK	R.T.	AREA/PPM
BENZENE	3	19.1	10.20 PPM
TOLUENE	4	38.7	8.988 PPM
ETHYLBENZENE	5	87.4	8.773 PPM
STYRENE	6	103.9	3.444 PPM

PHOTOVAC

START

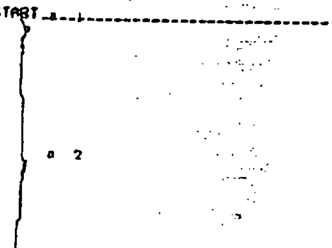


STOP 0 133.2
SAMPLE LIBRARY 1 JUN 30 1989 7:56
ANALYSIS # 3 0330-004-100
INTERNAL TEMP 29 PURGE STND
GAIN 10 5PPM STYRENE

COMPOUND NAME	PEAK	R.T.	AREA/PPM

PHOTOVAC

START # 1



STOP 0 180.0
SAMPLE LIBRARY 1 JUN 30 1989 8:0
ANALYSIS # 4 0330-004-100
INTERNAL TEMP 30 PURGE STND
GAIN 10 5PPM STYRENE

COMPOUND NAME	PEAK	R.T.	AREA/PPM

PHOTOVAC

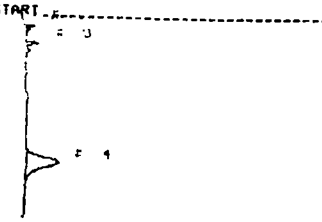
SAMPLE LIBRARY 1 JUN 30 1989 8:0
ANALYSIS # 4 0330-004-100
INTERNAL TEMP 29 PURGE STND
GAIN 10 5PPM STYRENE

OFFSET 15.0 μV
CHART SPEED 1 cm/Min
SLOPE SENS. 10 14 6 μV/Sec
WINDOW +/- 10 Percent
MINIMUM AREA 100 μVSec
TIMER DELAY 10.0 Sec
ANALYSIS TIME 300.0 Sec
CYCLE TIME 0 Min

COMPOUND NAME	PEAK	R.T.	AREA/PPM

PHOTOVAC

START #



CALIBRATED PEAK 4,STYRENE

SAMPLE LIBRARY 1 JUN 30 1989 8:4
ANALYSIS # 4 0330-004-100
INTERNAL TEMP 29 SAMPLE STND
GAIN 10 5PPM STYRENE

OFFSET 15.0 μV
CHART SPEED 1 cm/Min
SLOPE SENS. 10 14 6 μV/Sec
WINDOW +/- 10 Percent
MINIMUM AREA 100 μVSec
TIMER DELAY 10.0 Sec
ANALYSIS TIME 300.0 Sec
CYCLE TIME 0 Min

COMPOUND NAME	PEAK	R.T.	AREA/PPM
STYRENE	4	116.2	5.000 PPM

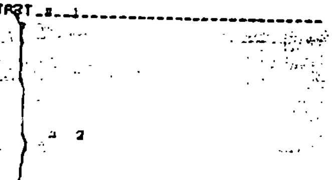
STOP 0 133.5
SAMPLE LIBRARY 1 JUN 30 1989 8:4
ANALYSIS # 5 0330-004-100
INTERNAL TEMP 30 SAMPLE STND
GAIN 10 5PPM STYRENE

OFFSET 15.0 μV
CHART SPEED 1 cm/Min
SLOPE SENS. 10 14 6 μV/Sec
WINDOL +/- 10 Percent
MINIMUM AREA 100 μVSec
TIMER DELAY 10.0 Sec
ANALYSIS TIME 300.0 Sec
CYCLE TIME 0 Min

COMPOUND NAME	PEAK	R.T.	AREA/PPM
STYRENE	4	116.2	5.000 PPM

PHOTOVAC

START # 1



STOP 0 123.7
SAMPLE LIBRARY 1 JUN 30 1989 8:5
ANALYSIS # 6 0330-004-100
INTERNAL TEMP 30 PURGE STND
GAIN 10 BTX

COMPOUND NAME	PEAK	R.T.	AREA/PPM

PHOTOVAC

SAMPLE LIBRARY 1 JUN 30 1989 7:32
ANALYSIS # 1 0350-004-100
INTERNAL TEMP 26 PURGE
GAIN 10 8-11-20

OFFSET 0.0 mU
CHART SPEED 1 cm/Min
SLOPE SENS. 10 14 6 mU/Sec
WINDOW +/- 10 Percent
MINIMUM AREA 100 mUSec
TIMER DELAY 10.0 Sec
ANALYSIS TIME 300.0 Sec
CYCLE TIME 0 Min

COMPOUND NAME PEAK R.T. AREA/PPM

PHOTOVAC

SAMPLE LIBRARY 1 JUN 30 1989 7:42
ANALYSIS # 0 0350-004-100
INTERNAL TEMP 26 PURGE STND
GAIN 10 5PPM STYRENE

OFFSET 33.0 mU
CHART SPEED 1 cm/Min
SLOPE SENS. 10 14 6 mU/Sec
WINDOW +/- 10 Percent
MINIMUM AREA 100 mUSec
TIMER DELAY 10.0 Sec
ANALYSIS TIME 300.0 Sec
CYCLE TIME 0 Min

COMPOUND NAME PEAK R.T. AREA/PPM

PHOTOVAC

SAMPLE LIBRARY 1 JUN 30 1989 7:44
ANALYSIS # 2 0350-004-100
INTERNAL TEMP 26 PURGE STND
GAIN 10 5PPM STYRENE

OFFSET 32.0 mU
CHART SPEED 1 cm/Min
SLOPE SENS. 10 14 6 mU/Sec
WINDOW +/- 10 Percent
MINIMUM AREA 100 mUSec
TIMER DELAY 10.0 Sec
ANALYSIS TIME 300.0 Sec
CYCLE TIME 0 Min

COMPOUND NAME PEAK R.T. AREA/PPM

PHOTOVAC

1 COMPOUND	ID #	R.T.	LIMIT
STYRENE	1	108.8	25.00 PPM
BENZENE	2	13.3	50.00 PPM
TOLUENE	3	33.5	50.00 PPM
ETHYLBENZENE	4	88.0	50.00 PPM

PHOTOVAC

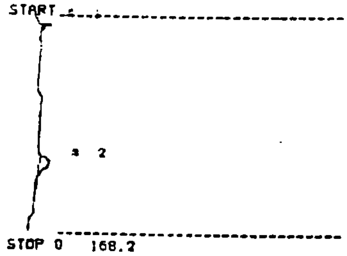
SAMPLE LIBRARY 1 JUN 30 1989 7:46
ANALYSIS # 0 0350-004-100
INTERNAL TEMP 26 PURGE STND
GAIN 10 5PPM STYRENE

OFFSET 33.0 mU
CHART SPEED 1 cm/Min
SLOPE SENS. 10 14 6 mU/Sec
WINDOW +/- 10 Percent
MINIMUM AREA 100 mUSec
TIMER DELAY 10.0 Sec
ANALYSIS TIME 300.0 Sec
CYCLE TIME 0 Min

COMPOUND NAME PEAK R.T. AREA/PPM

PHOTOVAC

START



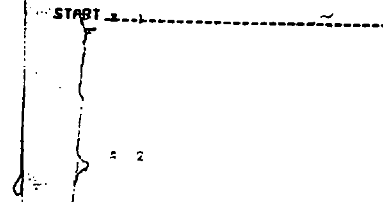
STOP 0 168.2
SAMPLE LIBRARY 1 JUN 30 1989 7:50
ANALYSIS # 1 0350-004-100
INTERNAL TEMP 26 PURGE STND
GAIN 10 5PPM STYRENE

OFFSET 30.0 mU
CHART SPEED 1 cm/Min
SLOPE SENS. 10 14 6 mU/Sec
WINDOW +/- 10 Percent
MINIMUM AREA 100 mUSec
TIMER DELAY 10.0 Sec
ANALYSIS TIME 300.0 Sec
CYCLE TIME 0 Min

COMPOUND NAME	PEAK	R.T.	AREA/PPM
STYRENE	2	116.8	1.254 PPM

PHOTOVAC

START

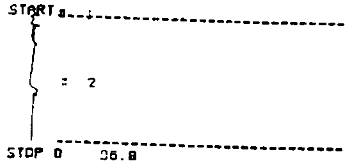


STOP 0 143.9
SAMPLE LIBRARY 1 JUN 30 1989 7:54
ANALYSIS # 2 0350-004-100
INTERNAL TEMP 28 PURGE STND
GAIN 10 5PPM STYRENE

COMPOUND NAME	PEAK	R.T.	AREA/PPM
STYRENE	2	114.1	1.073 PPM

PHOTOVAC

START

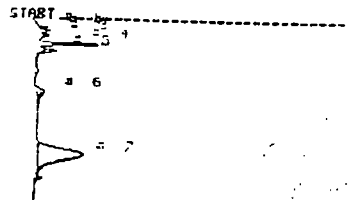


STOP 0 36.8
SAMPLE LIBRARY 1 JUN 28 1989 9: 5
ANALYSIS # 3 0350-004-100
INTERNAL TEMP 27 PURGE STND
GAIN 20 5PPM STYRENE

COMPOUND NAME	PEAK	R.T.	AREA/PPM

PHOTOVAC

START



STOP 0 141.1
SAMPLE LIBRARY 1 JUN 28 1989 9: 8
ANALYSIS # 4 0350-004-100
INTERNAL TEMP 28 SAMPLE STND
GAIN 20 5PPM STYRENE

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	4	20.5	266.5 mVS
STYRENE	7	107.2	5.421 PPM

PHOTOVAC

I	COMPOUND	ID #	R.T.	LIMIT
	STYRENE	1	109.5	25.00 PPM

PHOTOVAC

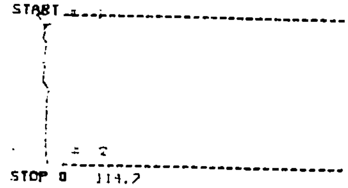
CALIBRATED PEAK 7,STYRENE

SAMPLE LIBRARY 1 JUN 28 1989 9: 9
ANALYSIS # 4 0350-004-100
INTERNAL TEMP 28 SAMPLE STND
GAIN 20 5PPM STYRENE

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	4	20.5	266.5 mVS
STYRENE	7	107.2	5.090 PPM

PHOTOVAC

START

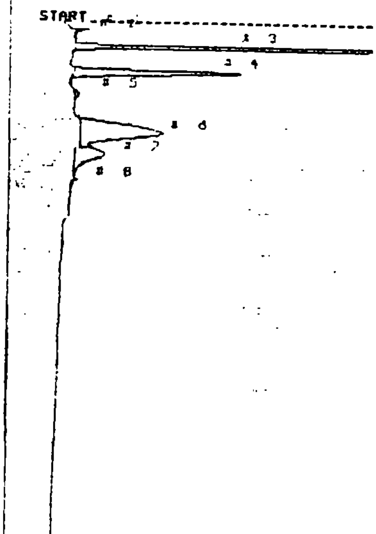


STOP 0 114.7
SAMPLE LIBRARY 1 JUN 28 1989 9:12
ANALYSIS # 5 0350-004-100
INTERNAL TEMP 28 PURGE
GAIN 20 10 PPM BTE

COMPOUND NAME	PEAK	R.T.	AREA/PPM

PHOTOVAC

START



STOP 0 338.3
SAMPLE LIBRARY 1 JUN 28 1989 9:15
ANALYSIS # 6 0350-004-100
INTERNAL TEMP 27 SAMPLE STND
GAIN 20 10 PPM BTE

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	3	15.5	2.6 VS
UNKNOWN	4	35.7	1.5 VS
UNKNOWN	6	88.5	3.2 VS
STYRENE	7	105.1	3.081 PPM

PHOTOVAC

SAMPLE LIBRARY 1 JUN 28 1989 9:22
ANALYSIS # 6 0350-004-100
INTERNAL TEMP 26 SAMPLE STND
GAIN 20 10 PPM BTE

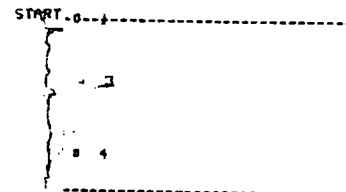
COMPOUND NAME	PEAK	R.T.	AREA/PPM
BENZENE	3	15.5	5.555 PPM
TOLUENE	4	35.7	10.00 PPM
ETHYLBENZENE	6	88.5	10.00 PPM
STYRENE	7	105.1	3.081 PPM

PHOTOVAC

I	COMPOUND	ID #	R.T.	LIMIT
	STYRENE	1	107.2	25.00 PPM
	BENZENE	2	15.5	50.00 PPM
	TOLUENE	3	35.7	50.00 PPM
	ETHYLBENZENE	4	88.3	50.00 PPM

PHOTOVAC

START



STOP 0 133.3
SAMPLE LIBRARY 1 JUN 28 1989 9:41
ANALYSIS # 7 0350-004-100
INTERNAL TEMP 27 PURGE
GAIN 20 B1-15

OFFSET 21.8 mV
CHART SPEED 1 cm/Min
SLOPE SENS. 18 14 6 mV/Sec
WINDOW +/- 10 Percent
MINIMUM AREA 100 mVSec
TIMER DELAY 10.0 Sec
ANALYSIS TIME 300.0 Sec
CYCLE TIME 0 Min

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	3	35.1	101.4 mVS

PHOTOVAC

START

STOP 0 6.5
SAMPLE LIBRARY 1 JUN 28 1989 9:43
ANALYSIS # 8 0350-004-100
INTERNAL TEMP 27 PURGE
GAIN 20 B1-15

COMPOUND NAME	PEAK	R.T.	AREA/PPM

```
PHOTOVAC

1    COMPOUND        ID #   R.T.    LIMIT

STYRENE              1    108.3  25.00 PPM
BENZENE              2     13.7  50.00 PPM
TOLUENE              3     40.1  50.00 PPM
ETHYLBENZENE         4     83.4  50.00 PPM
```

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PHOTOVAC

SAMPLE LIBRARY 1   JUN 28 1989   7:45
ANALYSIS #     0   0350-004-100
INTERNAL TEMP 26   SAMPLE
GAIN           2   B7-15

COMPOUND NAME    PEAK  R.T.  AREA/PPM
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PHOTOVAC

SAMPLE LIBRARY 1   JUN 28 1989   7:48
ANALYSIS #     2   0350-004-100
INTERNAL TEMP 26   SAMPLE
GAIN           2   B7-15

COMPOUND NAME    PEAK  R.T.  AREA/PPM
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PHOTOVAC

SAMPLE LIBRARY 1   JUN 28 1989   7:52
ANALYSIS #     0   0350-004-100
INTERNAL TEMP 25   SAMPLE
GAIN          10   B7-15

COMPOUND NAME    PEAK  R.T.  AREA/PPM
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PHOTOVAC

SAMPLE LIBRARY 1   JUN 28 1989   8:30
ANALYSIS #     0   0350-004-100
INTERNAL TEMP 25   PURGE STND
GAIN          20   5PPM STYRENE

OFFSET             65.0  mV
CHART SPEED        1     cm/min
SLOPE SENS.        10 14  6 mV/Sec
WINDOW     +/-     10    Percent
MINIMUM AREA       100   mVSec
TIMER DELAY        10.0  Sec
ANALYSIS TIME      500.0 Sec
CYCLE TIME         0     Min

COMPOUND NAME    PEAK  R.T.  AREA/PPM
```

```
PHOTOVAC

START
STOP 0    0.0
SAMPLE LIBRARY 1   JUN 28 1989   8:41
ANALYSIS #     1   0350-004-100
INTERNAL TEMP 25   PURGE STND
GAIN          20   5PPM STYRENE

OFFSET             51.0  mV
CHART SPEED        1     cm/min
SLOPE SENS.        10 14  6 mV/Sec
WINDOW     +/-     10    Percent
MINIMUM AREA       100   mVSec
TIMER DELAY        10.0  Sec
ANALYSIS TIME      500.0 Sec
CYCLE TIME         0     Min

COMPOUND NAME    PEAK  R.T.  AREA/PPM
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PHOTOVAC

JUN 28 1989   9:40

FIELD:  25
POWER:  44

SAMPLE       0.0    10.0
CAL          0.0     0.0
EVENT 3     10.0   120.0
EVENT 4      0.0     0.0
EVENT 5      0.0     0.0
EVENT 6      0.0     0.0
EVENT 7      0.0     0.0
EVENT 8      0.0     0.0
```

```
PHOTOVAC

SAMPLE LIBRARY 1   JUN 28 1989   8:54
ANALYSIS #     1   0350-004-100
INTERNAL TEMP 25   PURGE STND
GAIN          20   5PPM STYRENE

OFFSET             37.0  mV
CHART SPEED        1     cm/min
SLOPE SENS.        10 14  6 mV/Sec
WINDOW     +/-     10    Percent
MINIMUM AREA       100   mVSec
TIMER DELAY        10.0  Sec
ANALYSIS TIME      500.0 Sec
CYCLE TIME         0     Min

COMPOUND NAME    PEAK  R.T.  AREA/PPM
```

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PHOTOVAC

SAMPLE LIBRARY 1   JUN 28 1989   9:0
ANALYSIS #     1   0350-004-100
INTERNAL TEMP 25   PURGE STND
GAIN          20   5PPM STYRENE

OFFSET             34.0  mV
CHART SPEED        1     cm/min
SLOPE SENS.        10 14  6 mV/Sec
WINDOW     +/-     10    Percent
MINIMUM AREA       100   mVSec
TIMER DELAY        10.0  Sec
ANALYSIS TIME      500.0 Sec
CYCLE TIME         0     Min

COMPOUND NAME    PEAK  R.T.  AREA/PPM
```

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PHOTOVAC

START
```

```
# 2

STOP 0    75.6
SAMPLE LIBRARY 1   JUN 28 1989   9:3
ANALYSIS #     2   0350-004-100
INTERNAL TEMP 26   PURGE STND
GAIN          20   5PPM STYRENE

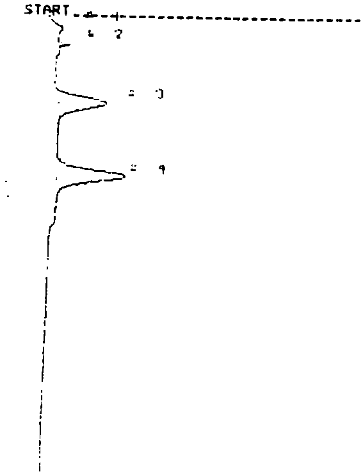
OFFSET             33.0  mV
CHART SPEED        1     cm/min
SLOPE SENS.        10 14  6 mV/Sec
WINDOW     +/-     10    Percent
MINIMUM AREA       100   mVSec
TIMER DELAY        10.0  Sec
ANALYSIS TIME      500.0 Sec
CYCLE TIME         0     Min

COMPOUND NAME    PEAK  R.T.  AREA/PPM

UNKNOWN           2   57.5  232.7 mVS
```

PHOTOVAC

START



SAMPLE LIBRARY 1 JUN 29 1989 8:29
ANALYSIS # 3 0350-004-100
INTERNAL TEMP 26 PURGE
GAIN 20 CAL

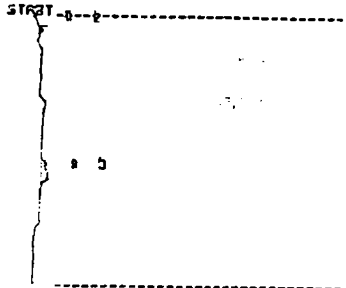
COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	3	63.3	1.5 US
UNKNOWN	4	128.0	2.2 US

STOP 0 428.8
SAMPLE LIBRARY 1 JUN 29 1989 8:31
ANALYSIS # 4 0350-004-100
INTERNAL TEMP 26 PURGE
GAIN 20 CAL

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	3	63.3	1.5 US
UNKNOWN	4	128.0	2.2 US

PHOTOVAC

START

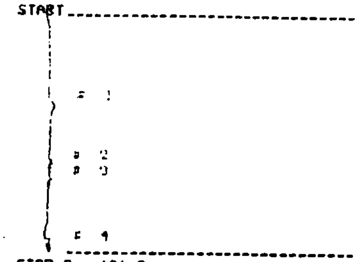


STOP 0 284.7
SAMPLE LIBRARY 1 JUN 29 1989 8:35
ANALYSIS # 5 0350-004-100
INTERNAL TEMP 27 PURGE STND
GAIN 20 5PPM STYRENE

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	3	124.0	227.2 mVS

PHOTOVAC

START



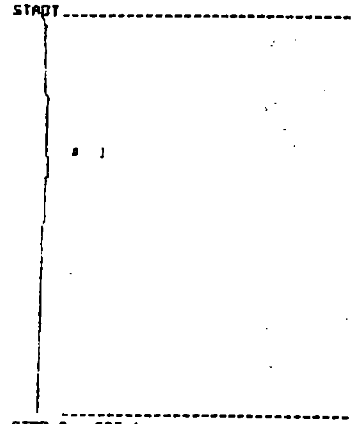
STOP 0 181.7
SAMPLE LIBRARY 1 JUN 29 1989 8:15
ANALYSIS # 1 0350-004-100
INTERNAL TEMP 26 PURGE
GAIN 10 CAL

OFFSET 25.0 mV
CHART SPEED 1 cm/min
SLOPE SENS. 10 14 6 mV/Sec
WINDOW +/- 10 Percent
MINIMUM AREA 100 mVSec
TIMER DELAY 10.0 Sec
ANALYSIS TIME 300.0 Sec
CYCLE TIME 0 Min

COMPOUND NAME PEAK R.T. AREA/PPM

PHOTOVAC

START

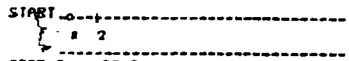


STOP 0 307.1
SAMPLE LIBRARY 1 JUN 29 1989 8:21
ANALYSIS # 2 0350-004-100
INTERNAL TEMP 26 PURGE
GAIN 10 CAL

COMPOUND NAME PEAK R.T. AREA/PPM

PHOTOVAC

START



STOP 0 27.2
SAMPLE LIBRARY 1 JUN 29 1989 8:23
ANALYSIS # 3 0350-004-100
INTERNAL TEMP 25 PURGE
GAIN 20 CAL

COMPOUND NAME PEAK R.T. AREA/PPM

PHOTOVAC

JUN 29 1989 8:0

FIELD: 29
POWER: 44

SAMPLE	0.0	10.0
CAL	0.0	3.0
EVENT 3	10.0	120.0
EVENT 4	0.0	0.0
EVENT 5	0.0	0.0
EVENT 6	0.0	0.0
EVENT 7	0.0	0.0
EVENT 8	0.0	0.0

PHOTOVAC

JUN 29 1989 8:2

FIELD: 29
POWER: 44

SAMPLE	0.0	10.0
CAL	0.0	0.0
EVENT 3	10.0	120.0
EVENT 4	0.0	0.0
EVENT 5	0.0	0.0
EVENT 6	0.0	0.0
EVENT 7	0.0	0.0
EVENT 8	0.0	0.0

PHOTOVAC

SAMPLE LIBRARY 1 JUN 29 1989 8:5
ANALYSIS # 0 0350-004-100
INTERNAL TEMP 25 SAMPLE
GAIN 10 B7-15

OFFSET 32.0 mV
CHART SPEED 1 cm/min
SLOPE SENS. 10 14 6 mV/Sec
WINDOW +/- 10 Percent
MINIMUM AREA 100 mVSec
TIMER DELAY 10.0 Sec
ANALYSIS TIME 300.0 Sec
CYCLE TIME 0 Min

COMPOUND NAME PEAK R.T. AREA/PPM

PHOTOVAC

SAMPLE LIBRARY 1 JUN 29 1989 8:9
ANALYSIS # 0 0350-004-100
INTERNAL TEMP 25 SAMPLE
GAIN 10 B7-15

OFFSET 28.0 mV
CHART SPEED 1 cm/min
SLOPE SENS. 10 14 6 mV/Sec
WINDOW +/- 10 Percent
MINIMUM AREA 100 mVSec
TIMER DELAY 10.0 Sec
ANALYSIS TIME 300.0 Sec
CYCLE TIME 0 Min

PHOTOVAC

CALIBRATED PEAK 7,ETHYLBENZENE

SAMPLE LIBRARY 1 JUN 29 1989 8:51
ANALYSIS # 3 0350-004-100
INTERNAL TEMP 27 SAMPLE STND
GAIN 20 BTX

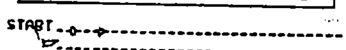
COMPOUND NAME	PEAK	R.T.	AREA/PPM
BENZENE	4	23.8	5.563 PPM
TOLUENE	5	49.5	10.07 PPM
ETHYLBENZENE	7	109.6	11.00 PPM
STYRENE	8	128.4	4.009 PPM

PHOTOVAC

SAMPLE LIBRARY 1 JUN 29 1989 8:51
ANALYSIS # 8 0350-004-100
INTERNAL TEMP 27 SAMPLE STND
GAIN 20 BTX

COMPOUND NAME	PEAK	R.T.	AREA/PPM
BENZENE	4	23.6	5.563 PPM
TOLUENE	5	49.5	10.07 PPM
ETHYLBENZENE	7	109.6	11.00 PPM
STYRENE	8	128.4	4.009 PPM

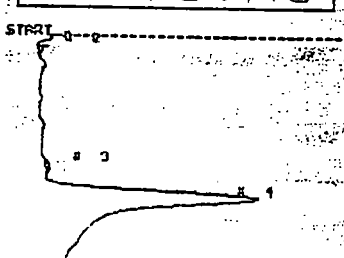
PHOTOVAC



STOP 0 13.8
SAMPLE LIBRARY 1 JUN 29 1989 8:53
ANALYSIS # 2 0350-004-100
INTERNAL TEMP 26 SAMPLE STND
GAIN 20 BTX

COMPOUND NAME PEAK R.T. AREA/PPM

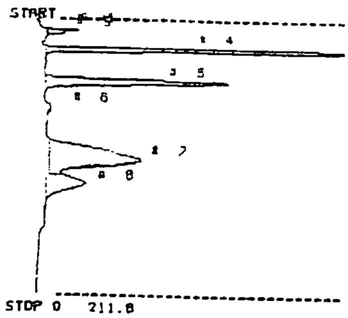
PHOTOVAC



STOP 0 173.9
SAMPLE LIBRARY 1 JUN 29 1989 9:2
ANALYSIS # 10 0350-004-100
INTERNAL TEMP 27 PURGE
GAIN 20 B-8-5

COMPOUND NAME	PEAK	R.T.	AREA/PPM
ETHYLBENZENE	3	102.9	277.1 PPB

PHOTOVAC



STOP 0 211.8
SAMPLE LIBRARY 1 JUN 29 1989 8:45
ANALYSIS # 8 0350-004-100
INTERNAL TEMP 27 SAMPLE STND
GAIN 20 BTX

COMPOUND NAME	PEAK	R.T.	AREA/PPM
BENZENE	4	23.8	12.03 PPM
TOLUENE	5	49.5	12.22 PPM
ETHYLBENZENE	7	109.6	13.35 PPM
STYRENE	8	128.4	4.867 PPM

PHOTOVAC

CALIBRATED PEAK 4,BENZENE

SAMPLE LIBRARY 1 JUN 29 1989 8:50
ANALYSIS # 8 0350-004-100
INTERNAL TEMP 27 SAMPLE STND
GAIN 20 BTX

COMPOUND NAME	PEAK	R.T.	AREA/PPM
BENZENE	4	23.8	10.20 PPM
TOLUENE	5	49.5	10.31 PPM
ETHYLBENZENE	7	109.6	11.20 PPM
STYRENE	8	128.4	4.104 PPM

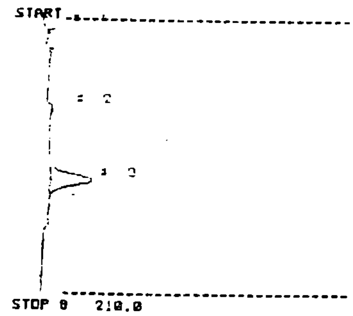
PHOTOVAC

CALIBRATED PEAK 5,TOLUENE

SAMPLE LIBRARY 1 JUN 29 1989 8:50
ANALYSIS # 8 0350-004-100
INTERNAL TEMP 27 SAMPLE STND
GAIN 20 BTX

COMPOUND NAME	PEAK	R.T.	AREA/PPM
BENZENE	4	23.8	10.40 PPM
TOLUENE	5	49.5	10.60 PPM
ETHYLBENZENE	7	109.6	11.57 PPM
STYRENE	8	128.4	4.220 PPM

PHOTOVAC



STOP 0 210.0
SAMPLE LIBRARY 1 JUN 29 1989 8:39
ANALYSIS # 6 0350-004-100
INTERNAL TEMP 27 SAMPLE STND
GAIN 20 5PPM STYRENE

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	3	127.2	1.3 US

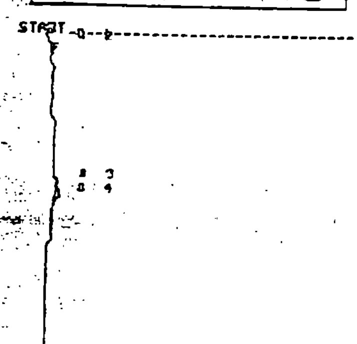
PHOTOVAC

CALIBRATED PEAK 3,STYRENE

SAMPLE LIBRARY 1 JUN 29 1989 8:40
ANALYSIS # 6 0350-004-100
INTERNAL TEMP 27 SAMPLE STND
GAIN 20 5PPM STYRENE

COMPOUND NAME	PEAK	R.T.	AREA/PPM
STYRENE	3	127.2	5.000 PPM

PHOTOVAC

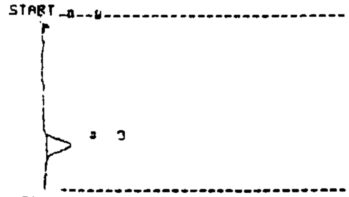


STOP 0 233.7
SAMPLE LIBRARY 1 JUN 29 1989 8:45
ANALYSIS # 7 0350-004-100
INTERNAL TEMP 27 PURGE STND
GAIN 20 BTX

COMPOUND NAME PEAK R.T. AREA/PPM

PHOTOVAC

START _a _ _ b

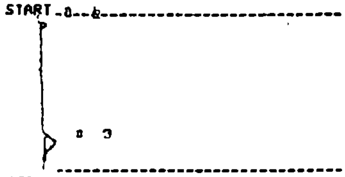


STOP 0 133.6
SAMPLE LIBRARY 1 JUN 29 1989 13:27
ANALYSIS # 4 0350-004-100
INTERNAL TEMP 35 PURGE STND
GAIN 10 5PPM STYRENE

COMPOUND NAME	PEAK	R.T.	AREA/PPM
ETHYLBENZENE	3	102.1	5.126 PPM

PHOTOVAC

START _a _ _ b

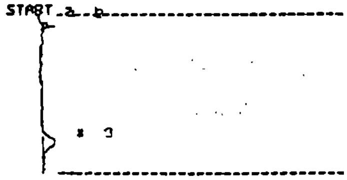


STOP 0 113.2
SAMPLE LIBRARY 1 JUN 29 1989 13:30
ANALYSIS # 5 0350-004-100
INTERNAL TEMP 35 PURGE STND
GAIN 10 5PPM STYRENE

COMPOUND NAME	PEAK	R.T.	AREA/PPM
ETHYLBENZENE	3	101.5	2.062 PPM

PHOTOVAC

START _a _ _ b



STOP 0 121.8
SAMPLE LIBRARY 1 JUN 29 1989 13:32
ANALYSIS # 6 0350-004-100
INTERNAL TEMP 35 PURGE STND
GAIN 10 5PPM STYRENE

COMPOUND NAME	PEAK	R.T.	AREA/PPM
ETHYLBENZENE	3	99.1	2.188 PPM

PHOTOVAC

SAMPLE LIBRARY 1 JUN 29 1989 13:18
ANALYSIS # 1 0350-004-100
INTERNAL TEMP 33 PURGE
GAIN 10 8-5-29

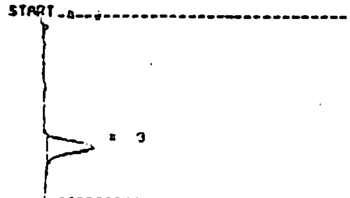
COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	83.2	701.2 mVS

PHOTOVAC

1 COMPOUND	ID #	R.T.	LIMIT
STYRENE	1	112.5	25.00 PPM
BENZENE	2	20.4	50.00 PPM
TOLUENE	3	41.7	50.00 PPM
ETHYLBENZENE	4	92.5	50.00 PPM

PHOTOVAC

START _a _ _ b

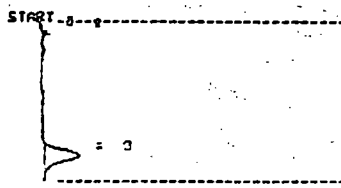


STOP 0 140.4
SAMPLE LIBRARY 1 JUN 29 1989 13:22
ANALYSIS # 2 0350-004-100
INTERNAL TEMP 34 PURGE STND
GAIN 10 5PPM STYRENE

COMPOUND NAME	PEAK	R.T.	AREA/PPM
STYRENE	3	103.0	11.88 PPM

PHOTOVAC

START _a _ _ b

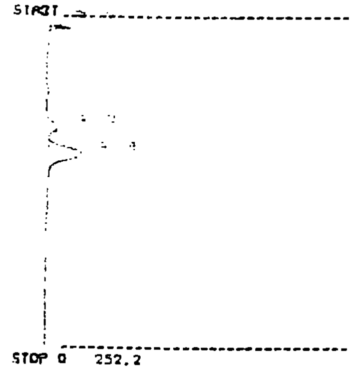


STOP 0 121.0
SAMPLE LIBRARY 1 JUN 29 1989 13:25
ANALYSIS # 3 0350-004-100
INTERNAL TEMP 34 PURGE STND
GAIN 10 5PPM STYRENE

COMPOUND NAME	PEAK	R.T.	AREA/PPM
STYRENE	3	104.2	8.445 PPM

PHOTOVAC

START _a _ _

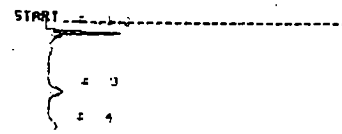


STOP 0 252.2
SAMPLE LIBRARY 1 JUN 29 1989 17:2
ANALYSIS # 1 0350-004-100
INTERNAL TEMP 31 PURGE
GAIN 10 8-5-29

COMPOUND NAME	PEAK	R.T.	AREA/PPM
ETHYLBENZENE	3	87.1	1.250 PPM
STYRENE	4	107.5	8.883 PPM

PHOTOVAC

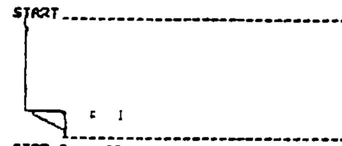
START _a _ _ b



JUN 29 1989 13:15
INTERNAL BATTERIES LOW, POWER OFF
AC OPERATION REQUIRED

PHOTOVAC

START

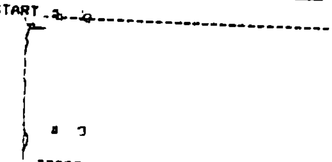


STOP 0 90.1
SAMPLE LIBRARY 1 JUN 29 1989 13:10
ANALYSIS # 1 0350-004-100
INTERNAL TEMP 32 PURGE
GAIN 10 8-5-29

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	83.2	701.2 mVS

PHOTOVAC

START

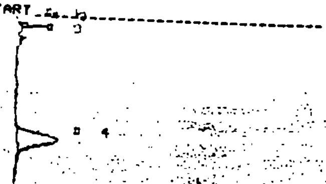


STOP 0 110.9
SAMPLE LIBRARY 1 JUN 29 1989 13:56
ANALYSIS # 12 0350-004-100
INTERNAL TEMP 38 PURGE STND
GAIN 10 5PPM STYRENE

COMPOUND NAME PEAK R.T. AREA/PPM

PHOTOVAC

START



CALIBRATED PEAK 4,STYRENE

SAMPLE LIBRARY 1 JUN 29 1989 13:59
ANALYSIS # 12 0350-C04-100
INTERNAL TEMP 37 SAMPLE STND
GAIN 10 5PPM STYRENE

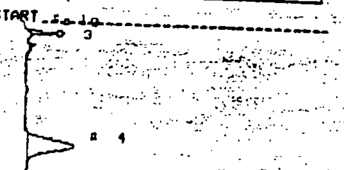
COMPOUND NAME	PEAK	R.T.	AREA/PPM
STYRENE	4	38.9	5.000 PPM

STOP 0 133.0
SAMPLE LIBRARY 1 JUN 29 1989 13:59
ANALYSIS # 13 0350-004-100
INTERNAL TEMP 38 SAMPLE STND
GAIN 10 5PPM STYRENE

COMPOUND NAME	PEAK	R.T.	AREA/PPM
STYRENE	4	38.9	5.000 PPM

PHOTOVAC

START

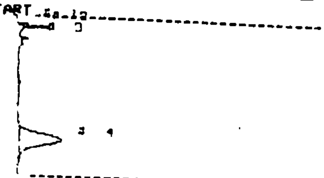


STOP 0 118.4
SAMPLE LIBRARY 1 JUN 29 1989 14:03
ANALYSIS # 14 0350-004-100
INTERNAL TEMP 37 SAMPLE STND
GAIN 10 5PPM STYRENE

COMPOUND NAME	PEAK	R.T.	AREA/PPM
STYRENE	4	37.3	5.730 PPM

PHOTOVAC

START



STOP 0 123.2
SAMPLE LIBRARY 1 JUN 29 1989 13:50
ANALYSIS # 10 0350-004-100
INTERNAL TEMP 38 SAMPLE STND
GAIN 10 5PPM STYRENE

COMPOUND NAME	PEAK	R.T.	AREA/PPM
ETHYLBENZENE	4	37.3	8.348 PPM

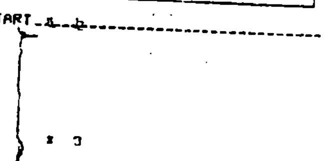
PHOTOVAC

SAMPLE LIBRARY 1 JUN 29 1989 13:51
ANALYSIS # 10 0350-004-100
INTERNAL TEMP 38 SAMPLE STND
GAIN 10 5PPM STYRENE

COMPOUND NAME	PEAK	R.T.	AREA/PPM
ETHYLBENZENE	4	37.3	8.348 PPM

PHOTOVAC

START

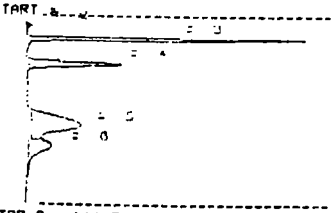


STOP 0 108.7
SAMPLE LIBRARY 1 JUN 29 1989 13:54
ANALYSIS # 11 0350-004-100
INTERNAL TEMP 35 PURGE STND
GAIN 10 5PPM STYRENE

COMPOUND NAME PEAK R.T. AREA/PPM

PHOTOVAC

START

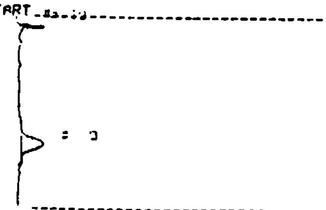


STOP 0 144.7
SAMPLE LIBRARY 1 JUN 29 1989 13:36
ANALYSIS # 7 0350-004-100
INTERNAL TEMP 36 SAMPLE STND
GAIN 10 BTX

COMPOUND NAME	PEAK	R.T.	AREA/PPM
BENZENE	3	18.9	11.74 PPM
TOLUENE	4	38.3	11.53 PPM
ETHYLBENZENE	5	86.9	13.56 PPM
ETHYLBENZENE	6	102.1	4.761 PPM

PHOTOVAC

START

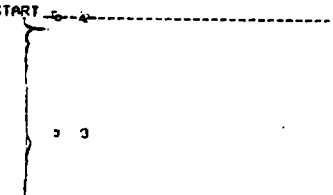


STOP 0 148.1
SAMPLE LIBRARY 1 JUN 29 1989 13:45
ANALYSIS # 8 0350-004-100
INTERNAL TEMP 35 SAMPLE STND
GAIN 10 BTX

COMPOUND NAME	PEAK	R.T.	AREA/PPM
ETHYLBENZENE	3	101.5	4.170 PPM

PHOTOVAC

START



STOP 0 148.3
SAMPLE LIBRARY 1 JUN 29 1989 13:48
ANALYSIS # 9 0350-004-100
INTERNAL TEMP 35 ~~SAMPLE STND~~ PURGE
GAIN 10 ~~BTX~~ 5ppm Sty.

COMPOUND NAME PEAK R.T. AREA/PPM

PHOTOVAC

COMPOUND	ID #	R.T.	LIMIT
STYRENE	1	102.2	25.00 PPM
BENZENE	2	19.5	50.00 PPM
TOLUENE	3	35.7	50.00 PPM
ETHYLBENZENE	4	88.3	50.00 PPM

PHOTOVAC

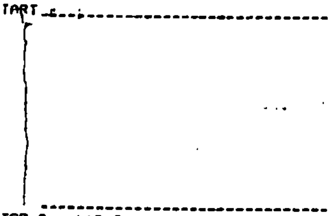
CALIBRATED PEAK 2,STYRENE

SAMPLE LIBRARY 1 JUN 28 1989 16:10
ANALYSIS # 77 0350-004-100
INTERNAL TEMP 35 SAMPLE STND
GAIN 10 5PPM STYRENE

COMPOUND NAME	PEAK	R.T.	AREA/PPM
STYRENE	2	101.8	5.000 PPM

PHOTOVAC

START

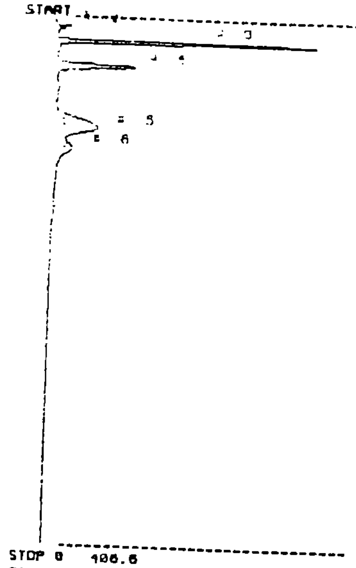


STOP 0 148.6
SAMPLE LIBRARY 1 JUN 28 1989 16:14
ANALYSIS # 78 0350-004-100
INTERNAL TEMP 35 PURGE STND
GAIN 10 10PPM BTE

COMPOUND NAME PEAK R.T. AREA/PPM

PHOTOVAC

START



STOP 0 406.6
SAMPLE LIBRARY 1 JUN 28 1989 16:21
ANALYSIS # 79 0350-004-100
INTERNAL TEMP 33 SAMPLE STND
GAIN 10 10PPM BTE

COMPOUND NAME	PEAK	R.T.	AREA/PPM
BENZENE	3	19.7	6.699 PPM
TOLUENE	4	39.0	5.718 PPM
ETHYLBENZENE	5	87.1	5.151 PPM
STYRENE	6	103.3	1.025 PPM

PHOTOVAC

CALIBRATED PEAK 3,BENZENE

SAMPLE LIBRARY 1 JUN 28 1989 16:22
ANALYSIS # 79 0350-004-100
INTERNAL TEMP 33 SAMPLE STND
GAIN 10 10PPM BTE

COMPOUND NAME	PEAK	R.T.	AREA/PPM
BENZENE	3	19.7	10.00 PPM
TOLUENE	4	39.0	8.534 PPM
ETHYLBENZENE	5	87.1	7.680 PPM
STYRENE	6	103.3	1.536 PPM

PHOTOVAC

CALIBRATED PEAK 4,TOLUENE

SAMPLE LIBRARY 1 JUN 28 1989 16:22
ANALYSIS # 79 0350-004-100
INTERNAL TEMP 33 SAMPLE STND
GAIN 10 10PPM BTE

COMPOUND NAME	PEAK	R.T.	AREA/PPM
BENZENE	3	19.7	11.71 PPM
TOLUENE	4	39.0	10.00 PPM
ETHYLBENZENE	5	87.1	9.000 PPM
STYRENE	6	103.3	1.800 PPM

PHOTOVAC

CALIBRATED PEAK 5,ETHYLBENZENE

SAMPLE LIBRARY 1 JUN 28 1989 16:24
ANALYSIS # 79 0350-004-100
INTERNAL TEMP 32 SAMPLE STND
GAIN 10 10PPM BTE

COMPOUND NAME	PEAK	R.T.	AREA/PPM
BENZENE	3	19.7	13.00 PPM
TOLUENE	4	39.0	11.10 PPM
ETHYLBENZENE	5	87.1	10.00 PPM
STYRENE	6	103.3	1.998 PPM

PHOTOVAC

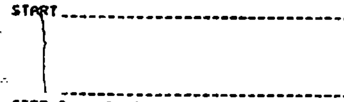
CALIBRATED PEAK 3,BENZENE

SAMPLE LIBRARY 1 JUN 28 1989 16:25
ANALYSIS # 79 0350-004-100
INTERNAL TEMP 33 SAMPLE STND
GAIN 10 10PPM BTE

COMPOUND NAME	PEAK	R.T.	AREA/PPM
BENZENE	3	19.7	10.00 PPM
TOLUENE	4	39.0	8.534 PPM
ETHYLBENZENE	5	87.1	7.680 PPM
STYRENE	6	103.3	1.536 PPM

PHOTOVAC

START

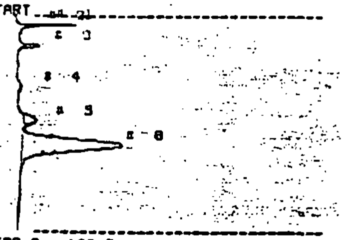


STOP 0 53.7
SAMPLE LIBRARY 1 JUN 28 1989 16:28
ANALYSIS # 80 0350-004-100
INTERNAL TEMP 33 PURGE
GAIN 10 87-15

COMPOUND NAME PEAK R.T. AREA/PPM

PHOTOVAC

START



STOP 0 166.3
SAMPLE LIBRARY 1 JUN 28 1989 10:31
ANALYSIS # 81 0350-C94-100
INTERNAL TEMP 34 SAMPLE
GAIN 10 07-XG
20

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	8.0	147.0 µVS
ETHYLBENZENE	5	82.9	1.938 PPM
STYRENE	6	102.4	21.81 PPM

PHOTOVAC

JUN 28 1989 10:32

FIELD: 30
POWER: 40

SAMPLE	0.0	10.0
CAL	0.0	0.0
EVENT 3	10.0	120.0
EVENT 4	0.0	0.0
EVENT 5	0.0	0.0
EVENT 6	0.0	0.0
EVENT 7	0.0	0.0
EVENT 8	0.0	0.0

PHOTOVAC

Amoco

PHOTOVAC

SAMPLE LIBRARY	1	JUN 27 1989 9:49
ANALYSIS #	0	0350-004-100
INTERNAL TEMP	29	PURGE
GAIN	20	5PPM STYRENE
OFFSET	63.0 mV	
CHART SPEED	1	cm/min
SLOPE SENS.	10 14	6 mV/Sec
WINDOW +/-	10	Percent
MINIMUM AREA	100	mVSec
TIMER DELAY	10.0	Sec
ANALYSIS TIME	300.0	Sec
CYCLE TIME	0	Min

COMPOUND NAME PEAK R.T. AREA/PPM

PHOTOVAC

JUN 27 198_ ___pm

FIELD: 29
POWER: 45

SAMPLE	0.0	10.0
CAL.	0.0	0.0
EVENT 3	10.0	120.0
EVENT 4	0.0	0.0
EVENT 5	0.0	0.0
EVENT 6	0.0	0.0
EVENT 7	0.0	0.0
EVENT 8	0.0	0.0

PHOTOVAC

SAMPLE LIBRARY	1	JUN 27 1989 9:53
ANALYSIS #	0	0350-C04-100
INTERNAL TEMP	29	PURGE
GAIN	20	5PPM STYRENE
OFFSET	51.0 mV	
CHART SPEED	1	cm/min
SLOPE SENS.	10 84	6 mV/Sec
WINDOW +/-	10	Percent
MINIMUM AREA	100	mVSec
TIMER DELAY	10.0	Sec
ANALYSIS TIME	300.0	Sec
CYCLE TIME	0	Min

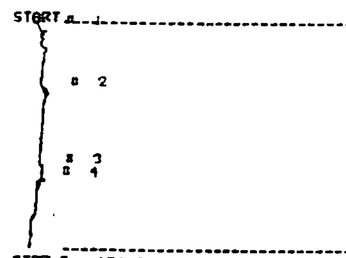
COMPOUND NAME PEAK R.T. AREA/PPM

PHOTOVAC

SAMPLE LIBRARY	1	JUN 27 1989 10:0
ANALYSIS #	0	0350-004-100
INTERNAL TEMP	29	PURGE
GAIN	20	5PPM STYRENE
OFFSET	43.0 mV	
CHART SPEED	1	cm/min
SLOPE SENS.	10 14	6 mV/Sec
WINDOW +/-	10	Percent
MINIMUM AREA	100	mVSec
TIMER DELAY	10.0	Sec
ANALYSIS TIME	300.0	Sec
CYCLE TIME	0	Min

COMPOUND NAME PEAK R.T. AREA/PPM

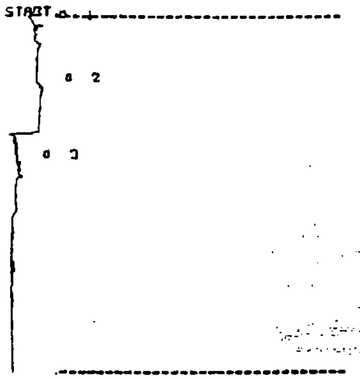
PHOTOVAC



SAMPLE LIBRARY	1	JUN 27 1989 10:5
ANALYSIS #	1	0350-C04-100
INTERNAL TEMP	30	PURGE
GAIN	20	5PPM STYRENE
OFFSET	38.0 mV	
CHART SPEED	1	cm/min
SLOPE SENS.	10 14	6 mV/Sec
WINDOW +/-	10	Percent
MINIMUM AREA	100	mVSec
TIMER DELAY	10.0	Sec
ANALYSIS TIME	300.0	Sec
CYCLE TIME	0	Min

COMPOUND NAME PEAK R.T. AREA/PPM

PHOTOVAC

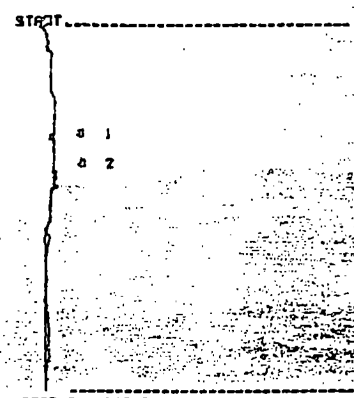


STOP 0 273.4
SAMPLE LIBRARY 1 JUN 27 1989 10:19
ANALYSIS # 2 0350-C94-100
INTERNAL TEMP 31 PURGE
GAIN 20 5PPM STYRENE

OFFSET 33.0 mV
CHART SPEED 1 cm/min
SLOPE SENS. 10 14 6 mV/Sec
WINDOW +/- 10 Percent
MINIMUM AREA 100 mVSec
TIMER DELAY 10.0 Sec
ANALYSIS TIME 300.0 Sec
CYCLE TIME 0 Min

COMPOUND NAME PEAK R.T. AREA/PPM

PHOTOVAC

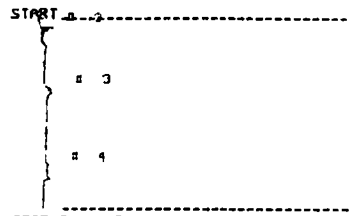


STOP 0 277.9
SAMPLE LIBRARY 1 JUN 27 1989 10:27
ANALYSIS # 3 0350-C94-100
INTERNAL TEMP 31 PURGE
GAIN 20 5PPM STYRENE

OFFSET 28.0 mV
CHART SPEED 1 cm/min
SLOPE SENS. 10 14 6 mV/Sec
WINDOW +/- 10 Percent
MINIMUM AREA 100 mVSec
TIMER DELAY 10.0 Sec
ANALYSIS TIME 300.0 Sec
CYCLE TIME 0 Min

COMPOUND NAME PEAK R.T. AREA/PPM

PHOTOVAC

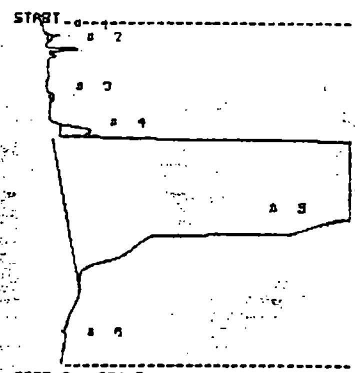


STOP 0 145.2
SAMPLE LIBRARY 1 JUN 27 1989 10:30
ANALYSIS # 4 0350-004-100
INTERNAL TEMP 32 PURGE
GAIN 20 5PPM STYRENE

COMPOUND NAME PEAK R.T. AREA/PPM

Syringe Contam

PHOTOVAC

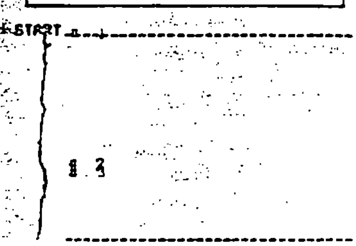


STOP 0 264.9
SAMPLE LIBRARY 1 JUN 27 1989 10:35
ANALYSIS # 5 0350-C94-100
INTERNAL TEMP 31 SAMPLE
GAIN 10 5PPM STYRENE

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	2	20.3	123.5 mVS
UNKNOWN	4	88.2	872.5 mVS
UNKNOWN	5	122.2	625.5 VS

Purge

PHOTOVAC

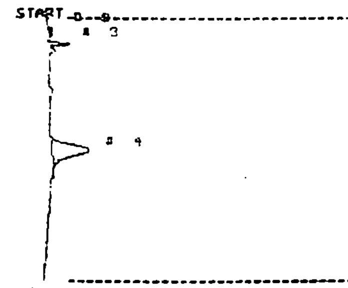


STOP 0 138.8
SAMPLE LIBRARY 1 JUN 27 1989 10:38
ANALYSIS # 6 0350-004-100
INTERNAL TEMP 32 PURGE
GAIN 10 5PPM STYRENE

COMPOUND NAME PEAK R.T. AREA/PPM

5ppm Inj - Gain 10

PHOTOVAC

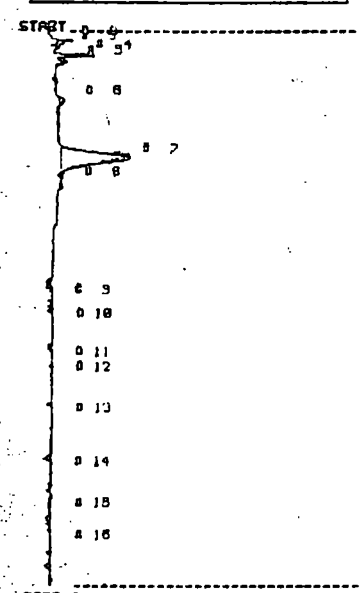


STOP 0 200.7
SAMPLE LIBRARY 1 JUN 27 1989 10:42
ANALYSIS # 7 0350-004-100
INTERNAL TEMP 32 SAMPLE
GAIN 10 5PPM STYRENE

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	4	104.2	1.1 VS

Gain = 20

PHOTOVAC



STOP 0 425.5
SAMPLE LIBRARY 1 JUN 27 1989 11:14
ANALYSIS # 8 0350-C94-100
INTERNAL TEMP 29 SAMPLE
GAIN 20 5PPM STYRENE

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	4	13.4	107.8 mVS
UNKNOWN	7	109.3	2.8 VS

SIMON Environmental Engineering

0639-2336

REPORT OF GROUNDWATER SAMPLING
AND ANALYSIS
JUNE, 1991
AMOCO CHEMICAL COMPANY
TORRANCE, CALIFORNIA

PROJECT NO. 512-345

SIMON-EEI

REPORT OF GROUNDWATER SAMPLING
AND ANALYSIS
JUNE, 1991
AMOCO CHEMICAL COMPANY
TORRANCE, CALIFORNIA

PROJECT NO. 512-345

1050-0001(

SIMON Environmental Engineering

SIMON-EEI Inc.
5882 Bolsa Avenue
Huntington Beach, CA 92649

Telephone (714) 891-7446
Telephone (213) 430-6500
Fax (714) 891-9009

August 30, 1991

Amoco Chemical Company
1225 West 196th Street
Torrance, California 90502

Attention: Mr. Robert Doerr
Environmental Coordinator

Subject: Report of Groundwater Sampling and Analysis
June, 1991
Amoco Chemical Facility
1225 West 196th Street
Torrance, California
Project No. 512-345

Dear Mr. Doerr:

Presented herewith is the report of groundwater sampling performed by Simon-EEI Inc. This assessment was performed at the request of Amoco, Inc. to monitor volatile and semi-volatile organic compounds in six groundwater monitoring wells at the subject site.

We trust this report meets your current requirements. Should you have questions regarding the results contained herein, or require further clarification, please contact us. We appreciate the opportunity to be of continued service to Amoco.

Respectfully,

LChaidez

Leobardo Chaidez
Geologist

LC:al

cc: Jeff Campbell - Amoco
T.M. Stark - Amoco
C.F. Kirby - Amoco

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REPORT OF GROUNDWATER SAMPLING AND ANALYSIS

JUNE, 1991

AMOCO CHEMICAL COMPANY

TORRANCE, CALIFORNIA

Prepared for:

Amoco Chemical Company
1225 West 196th Street
Torrance, California 90502

Submitted by:

Simon-EEI Inc.
6695 East Pacific Coast Highway
Long Beach, California 90803
213/430-6500

Leobardo Chaidez
Geologist

N. Mark Reese
Regional Manager
Southern California

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REPORT OF GROUNDWATER SAMPLING AND ANALYSIS
JUNE, 1991
AMOCO CHEMICAL COMPANY
TORRANCE, CALIFORNIA

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REPORT OF GROUNDWATER SAMPLING AND ANALYSIS
AMOCO CHEMICAL COMPANY
TORRANCE, CALIFORNIA
JUNE, 1991

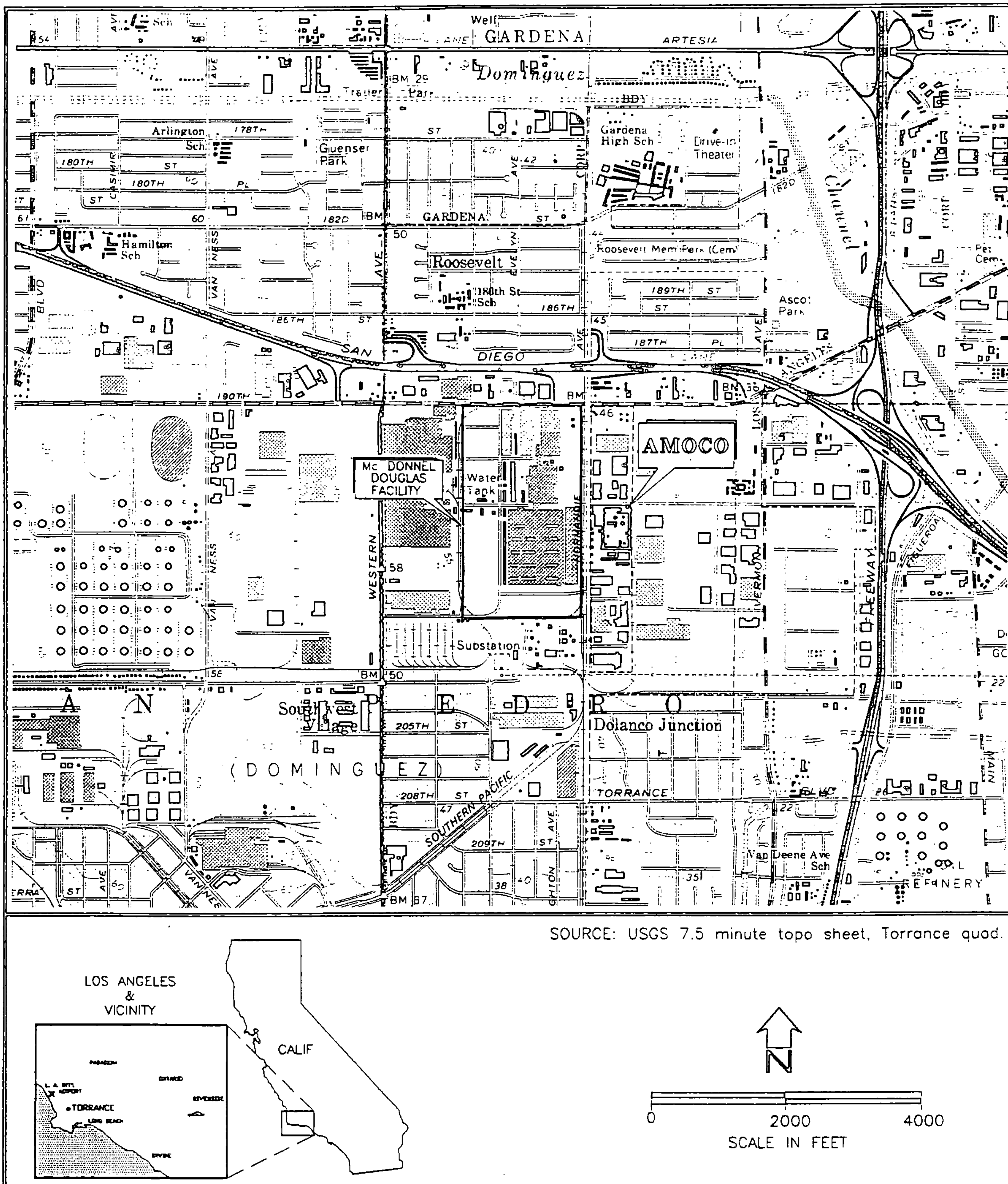
1.0 INTRODUCTION

Amoco Chemical Company operates a facility at 1225 West 196th Street, Torrance, California for the conversion of styrene monomer to styrene polymer (Figure 1). Initial groundwater samples were obtained from the six groundwater monitoring wells located onsite in early 1989 and analyzed by Amoco's laboratory in Joliet, Illinois. Results reported verbally by Amoco to Engineering Enterprises, Inc. indicated no organic compounds were detected. Simon-EEI (formerly Engineering Enterprises) was requested by Amoco to collect groundwater samples from the wells in February, 1990. Results from this event indicated the presence of volatile organic compounds in all wells. Confirmation sampling and analysis was conducted three weeks after the February 1990 event with samples sent to two independent laboratories. Reported results verified the previously reported concentrations. Amoco requested Simon-EEI to conduct groundwater sampling and analysis on a biannual basis beginning in December, 1990.

This report contains the results of the June 20, 1991 groundwater sampling event performed by Simon-EEI.

2.0 PURPOSE

The purpose of the groundwater sampling was to evaluate the concentration of volatile and semi-volatile organic compounds in groundwater samples collected from six onsite monitoring wells.



SITE LOCATION MAP
AMOCO CHEMICAL FACILITY
TORRANCE, CALIFORNIA

SIMON-EEI Inc.

PROJECT NO: 512-345	FIGURE NO: 1
DATE: AUGUST, 1991	

3.0 SCOPE OF WORK

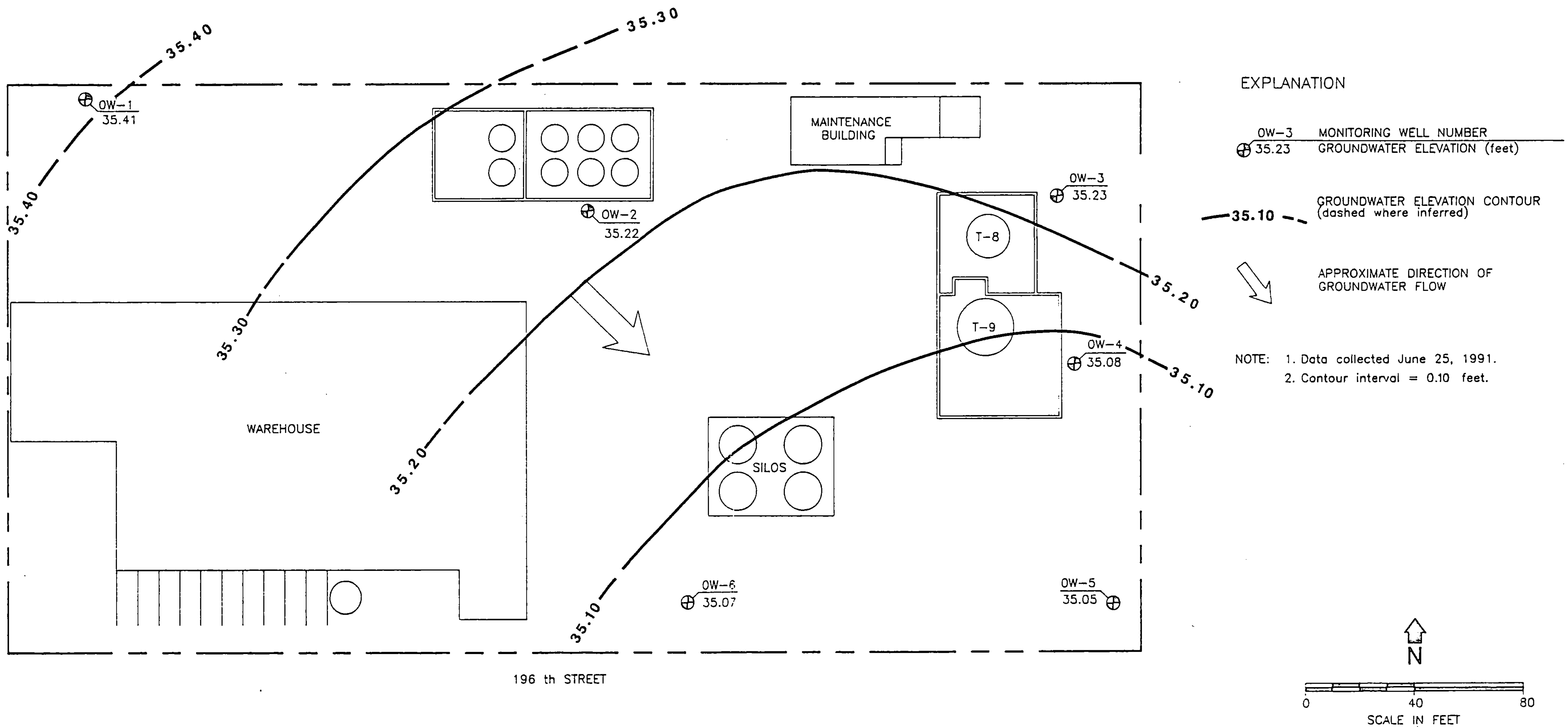
To achieve the purpose stated above, the following scope of work was performed:

- Groundwater samples from the six onsite groundwater monitoring wells were collected in accordance with EPA SW-846 protocol;
- Groundwater samples were chemically analyzed using EPA methods 8240 and 8270 for volatile and semi-volatile organic compounds, respectively; and,
- This report was prepared to present analytical data and concentration trends over time.

4.0 GROUNDWATER SAMPLING METHODOLOGY

Groundwater sampling was conducted on the six groundwater monitoring wells located onsite (Figure 2). Prior to sampling, wells were gauged to identify depth of water, depth of well and volume of water within the well bore. Wells were then purged of at least five well volumes of water using a disposable polyethylene bailer. Measurements of temperature, electrical conductivity and pH were taken during the purging process. When five well volumes of water had been purged and three consecutive readings had stabilized to within ten percent of one another, groundwater samples were collected for laboratory analysis.

Groundwater samples were collected using disposable polyethylene bailers fitted with controlled flow emptying devices. Samples were collected into laboratory clean glass vials having lids with Teflon



GROUNDWATER ELEVATION CONTOUR MAP
1225 WEST 196th STREET
TORRANCE, CALIFORNIA

SIMON-EEI Inc.

PROJECT NO: 512-345	FIGURE: 2
DATE: JUNE, 1991	

lined septa and containing hydrochloric acid as a preservative. Samples were transferred from the bailer to the vials using the submerged fill technique. Lids were replaced on the vials and the vials inverted and visually checked for the presence of entrapped air. Samples containing air were uncapped, refilled and rechecked. Samples not containing air had labels affixed which contained the following information: date, samplers initials, job number, well number, sample number and requested analyses. Appropriately sealed and labeled samples were then placed in an ice chest containing frozen blue-ice for transport to the analytical laboratory. A field blank was collected by pouring distilled water into a clean bailer and then decanting the water into sample vials. A blind duplicate sample was collected from well OW-2 and submitted to the laboratory as sample number OW-100. Chain-of-custody forms were completed in the field and accompanied the samples to the laboratory. Bailers were discarded after use.

5.0 LABORATORY ANALYSIS

Groundwater samples were analyzed using EPA methods 8240 and 8270 for volatile and semi-volatile organic compounds, respectively. Laboratory reports and chain-of-custody forms are included in Appendix A.

6.0 DISCUSSION OF RESULTS

Groundwater beneath the site occurs under water table conditions at an approximate depth of 75 feet below ground surface, or at an elevation of approximately 35 feet above mean sea level. The groundwater gradient is approximately 0.001 feet per foot to the southeast. Monitoring well hydrographs are included in Appendix B.

All groundwater samples contained detectable concentrations of volatile organic compounds. Semi-volatile compounds were not detected in any of the groundwater samples.

Upgradient well OW-1 was reported with a concentration of 1,100,000 ug/L of Methyl-Chloride. To determine the analyte concentration, the analytical laboratory used a high dilution factor (5,000) in the groundwater sample, thereby limiting the detection of lower concentrations on the remaining compounds. Organic compounds with a concentration below 5,000 ug/L could not be detected by the analytical instrument.

Monitoring well OW-2 located downgradient of the storage tank area had reported concentrations of 1,2 Dichloroethene, Trichloroethene (TCE), and Tetrachloroethene (PCE). Table 1 contains reported concentrations of detected compounds by well number.

Well OW-3 located northeast and upgradient of tanks T-8 and T-9 is reported with a decrease in concentration in 1,1 Dichloroethene, 1,2 dichloroethene, TCE, and PCE compared to the December 1990, sampling event. Analysis of the water sample from well OW-4 indicates an increase in concentration of 1,2 Dichloroethene (60 ug/L), and TCE (600 ug/L). PCE decreased from 1600 to 1000 ug/L.

Downgradient well OW-5 has a reported increase in the concentration of 1,2 Dichloroethene from 670 to 900 ug/L, and a decrease of TCE from 21,000 to 15,000 ug/L and PCE from 8,000 to 6,000 ug/L.

1,1 Dichoroethene and 1,2 Dichloroethene were not detected above 200 ug/L in monitoring well OW-6. TCE and PCE decreased in concentration from 27,000 to 22,000 ug/L and from 11,000 to 10,000 ug/L respectively.

Except for well OW-3, overall concentrations of the above mentioned organic compounds have increased since February 1990. The trend of selected organic compounds over time is presented in Table 2.

The occurrence of organic compounds in monitoring well OW-1 suggests an offsite source for the contaminants. It is to be noted that such organic compounds as 1,1 Dichoroethene, 1,2 Dichloroethene, Trichloroethene (TCE), Tetrachloroethene (PCE) and Methylene-Chloride are part of the compounds included in the report of findings in our review of the California Regional Water Quality

Control Board (CRWQCB) files regarding the McDonnell-Douglas aircraft facility located on 190th St. Torrance, California (Figure 1).

According to Philip H. Howard (Fate and Exposure Data for Organic Chemicals, Vol. II. Solvents), the reported chemical compounds detected in groundwater may be released to the environment as waste water during their use as industrial solvents, metal degreasers and paint removers, or during production of these compounds. Also, they are associated with the chemical process of thermo-plastics and synthetic rubber among others.

Maps showing detected concentrations of three organic compounds, Cis-1,2 Dichloroethene, Trichloroethene and tetrachloroethene are presented in Figures 3-5, respectively. Graphs of detected volatile compound concentrations over time are contained in Appendix C.

7.0 LIMITATIONS

The discussion of the results presented above are based upon:

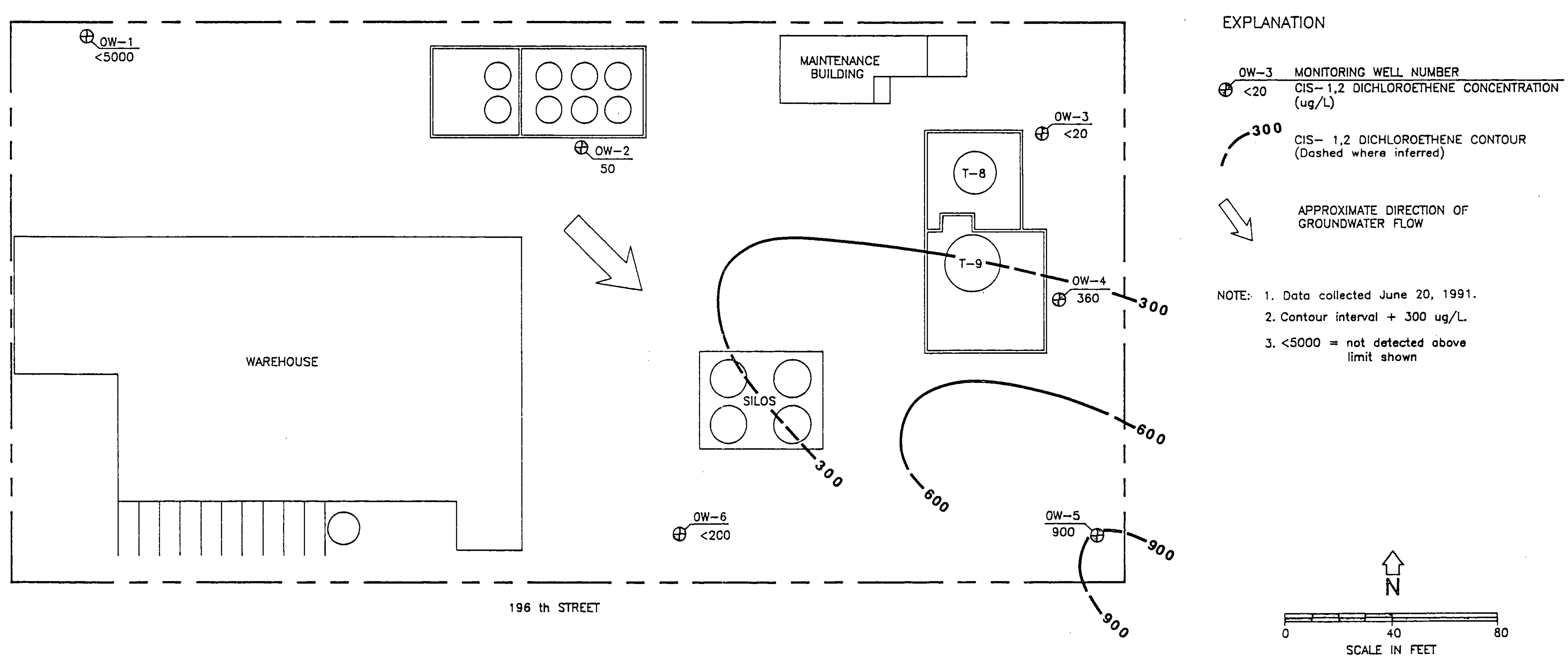
- o Observations and measurements collected during the sampling of six groundwater monitoring wells;
- o Results of laboratory analyses conducted on groundwater samples by Analytical Technologies, Inc. of San Diego, California;
- o Review of files at the Regional Water Quality Control Board (August, 1990).

TABLE 1

REPORTED ANALYTICAL RESULTS OF SELECTED COMPOUNDS

	EPA Method	Units	OW-00 (Field Blank)	OW-01	OW-2	OW-3	OW-4	OW-5	OW-6
Sampling Date 06/20/91									
1,1 Dichloroethene	8240	ug/l	<1	<5000(a)	<20	<20	<50	<200	<200
Methylene Chloride	8240	ug/l	<5	1100000	<100	<100	<250	<1000	<1000
Cis-1,2-Dichloroethene	8240	ug/l	<1	<5000	50	<20	360	900	<200
Chloroform	8240	ug/l	<1	<5000	<20	<20	<50	<200	<200
Trichloroethene	8240	ug/l	<1	<5000	2700	1900	7800	15000	22000
Tetrachloroethene	8240	ug/l	<1	<5000	410	270	1000	6600	10000
Semi-Volatile Organic Compounds	8270	ug/l	<1	ND(b)	ND	ND	ND	ND	ND

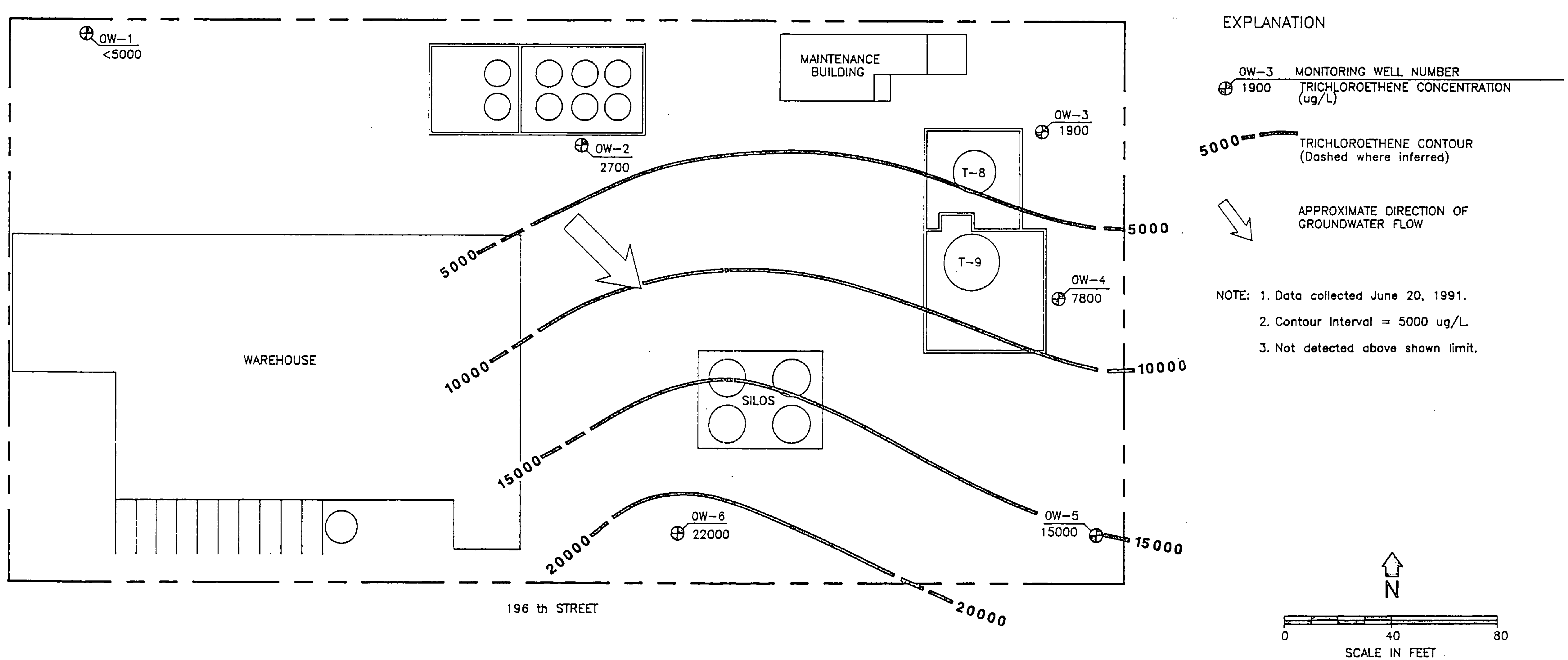
(a) <5000 = Not detected above limit shown.
(b) ND = Not detected.



CIS – 1,2 DICHLOROETHENE CONCENTRATION MAP
1225 WEST 196th STREET
TORRANCE, CALIFORNIA

simon-EEI Inc.

PROJECT NO: 512-345	FIGURE: 3
DATE: JUNE, 1991	



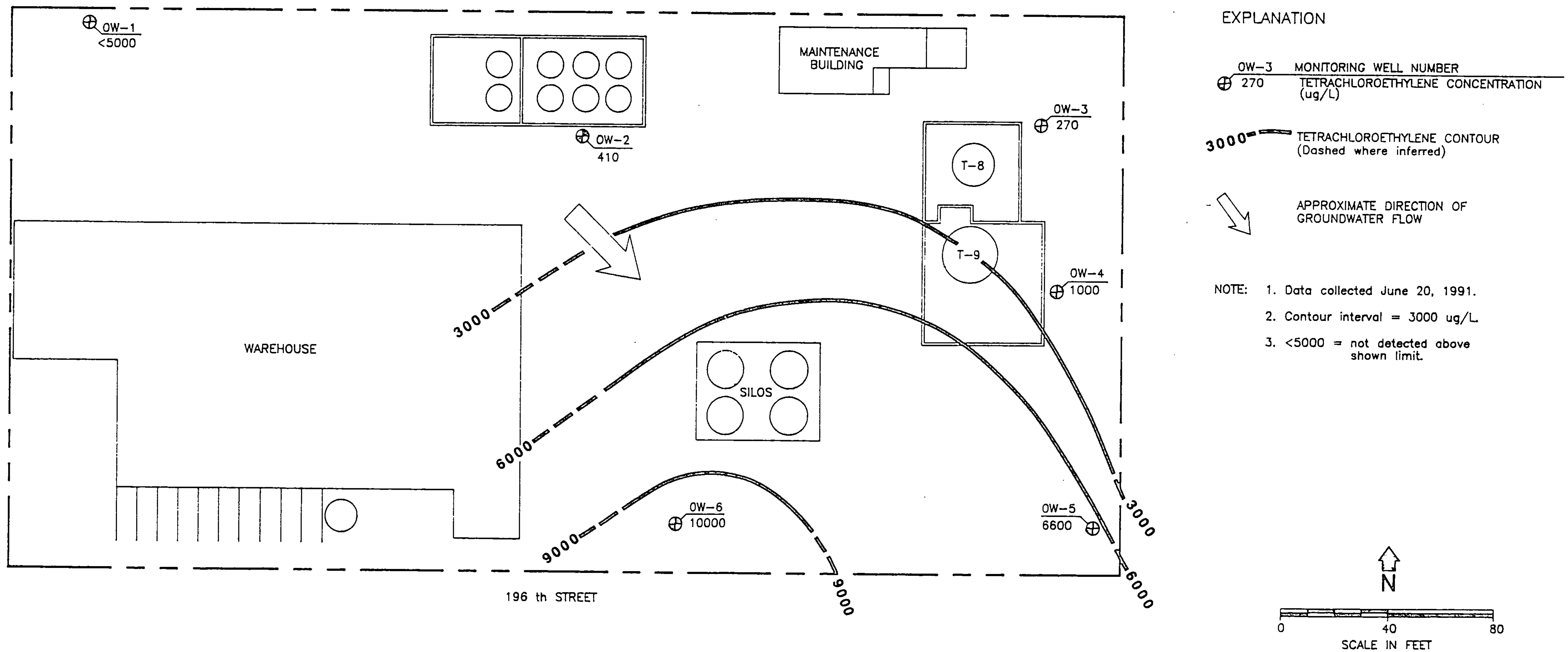
TRICHLOROETHENE CONCENTRATION MAP
1225 WEST 196th STREET
TORRANCE, CALIFORNIA

simon-EEI Inc.

PROJECT NO: 512-345

FIGURE: 4

DATE: JUNE, 1991



TETRACHLOROETHYLENE CONCENTRATION MAP
1225 WEST 196th STREET
TORRANCE, CALIFORNIA

simon-EEI Inc.

PROJECT NO: 512-345	FIGURE: 5
DATE: JUNE, 1991	

TABLE 2

AMOCO CHEMICAL COMPANY
SELECTED ORGANIC COMPOUNDS OVER TIME

Well No.	Date	1,1 Dichloro-ethene	1,2 Dichloro-ethene	Trichloro-ethene	Tetrachloro-ethene	Methyl-Chloride
01	2/21/90	<1500	<1500	2200	<1500	190000
	12/05/90	<1000	<1000	2000	<1000	320000
	6/20/91	<5000	<5000	<5000	<5000	1100000
02	2/21/90	<5	6	1100	160	<25
	12/05/90	<10	56	3000	420	<10
	6/20/91	<20	50	2700	410	<20
03	2/21/90	35	150	3800	1100	<20
	12/05/90	<20	73	2600	290	<20
	6/20/91	<20	<20	1900	270	<20
04	2/21/90	45	87	3400	400	<15
	12/05/90	46	330	7200	1600	<40
	6/20/91	<50	360	7800	1000	<50
05	2/21/90	<80	380	15000	5900	<400
	12/05/90	<100	670	21000	8100	<100
	6/20/91	<200	900	15000	6600	<200
06	2/21/90	56	59	7800	3300	<40
	12/05/90	<100	270	27000	11000	<100
	6/20/91	<200	<200	22000	10000	<200

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Simon-EEI Inc. warrants that services provided in conjunction with this assessment were performed in a manner consistent with the level of care and skill ordinarily exercised by members of our profession currently practicing in the Los Angeles County area. No other warranty, express or implied, is made.

APPENDIX A

LABORATORY REPORTS AND CHAIN-OF-CUSTODY FORMS

AnalyticalTechnologies,Inc. Corporate Offices: 5550 Morehouse Drive San Diego, CA 92121 (619) 458-9141

ATI I.D.: 106484

July 24, 1991

SIMON-EEI INC.
5882 BOLSA AVE.
HUNTINGTON BEACH, CA 92649

Project Name: (NONE)
Project # : 512-345

Attention: LEOBARDO CHAIDEZ

Analytical Technologies, Inc. has received the following sample(s):

Date Received	Quantity	Matrix
June 26, 1991	8	WATER

The sample(s) were analyzed with EPA methodology or equivalent methods as specified in the enclosed analytical schedule. The symbol for "less than" indicates a value below the reportable detection limit. Please see the attached sheet for the sample cross reference table.

The results of these analyses and the quality control data are enclosed.

Susan Snyder
SUSAN M. SNYDER
SENIOR PROJECT MANAGER

Kenneth Wahl
KENNETH WAHL
LABORATORY MANAGER

AnalyticalTechnologies,Inc.

SAMPLE CROSS REFERENCE

Client : SIMON-EEI INC.
Project # : 512-345
Project Name: (NONE)

Report Date: July 24, 1991
ATI I.D. : 106484

ATI #	Client Description	Matrix	Date Collected
1	OW-00	WATER	25-JUN-91
2	OW-1	WATER	25-JUN-91
3	OW-2	WATER	25-JUN-91
4	OW-3	WATER	25-JUN-91
5	OW-4	WATER	25-JUN-91
6	OW-5	WATER	25-JUN-91
7	OW-6	WATER	25-JUN-91
8	OW-100	WATER	25-JUN-91

---TOTALS---

Matrix	# Samples
WATER	8

ATI STANDARD DISPOSAL PRACTICE

The sample(s) from this project will be disposed of in twenty-one (21) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.

Analytical**Technologies**,Inc.

ANALYTICAL SCHEDULE

Client : SIMON-EEI INC.
Project # : 512-345
Project Name: (NONE)

ATI I.D.: 106484

Analysis	Technique/Description
EPA 8240 (GC/MS FOR VOLATILE ORGANICS)	GC/MASS SPECTROMETER
EPA 8270 (GC/MS FOR SEMIVOLATILE ORGANICS)	GC/MASS SPECTROMETER

AnalyticalTechnologies,Inc.

GAS CHROMATOGRAPHY/MASS SPECTROSCOPY RESULTS

Test : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)
Client : SIMON-EEI INC.
Project # : 512-345
Project Name: (NONE)

ATI I.D. : 106484

Sample #	Client ID	Matrix	Date Sampled	Date Extracted	Date Analyzed	Dil. Factor
1	OW-00	WATER	25-JUN-91	N/A	03-JUL-91	1.00
2	OW-1	WATER	25-JUN-91	N/A	03-JUL-91	5000.00
3	OW-2	WATER	25-JUN-91	N/A	03-JUL-91	20.00

Parameter	Units	1	2	3
CHLOROMETHANE	UG/L	<10	<50000	<200
VINYL CHLORIDE	UG/L	<1	<5000	<20
BROMOMETHANE	UG/L	<10	<50000	<200
CHLOROETHANE	UG/L	<1	<5000	<20
ACETONE	UG/L	<20	<100000	<400
1,1-DICHLOROETHENE	UG/L	<1	<5000	<20
METHYLENE CHLORIDE	UG/L	<5	1100000	<100
CARBON DISULFIDE	UG/L	<1	<5000	<20
TRANS-1,2-DICHLOROETHENE	UG/L	<1	<5000	<20
VINYL ACETATE	UG/L	<10	<50000	<200
1,1-DICHLOROETHANE	UG/L	<1	<5000	<20
CIS-1,2-DICHLOROETHENE	UG/L	<1	<5000	50
CHLOROFORM	UG/L	<1	<5000	<20
2-BUTANONE (MEK)	UG/L	<20	<100000	<400
1,1,1-TRICHLOROETHANE	UG/L	<1	<5000	<20
CARBON TETRACHLORIDE	UG/L	<1	<5000	<20
1,2-DICHLOROETHANE	UG/L	<1	<5000	<20
BENZENE	UG/L	<1	<5000	<20
TRICHLOROETHENE	UG/L	<1	<5000	2700
1,2-DICHLOROPROPANE	UG/L	<1	<5000	<20
BROMODICHLOROMETHANE	UG/L	<1	<5000	<20
4-METHYL-2-PENTANONE (MIBK)	UG/L	<10	<50000	<200
CIS-1,3-DICHLOROPROPENE	UG/L	<1	<5000	<20
TOLUENE	UG/L	<2	<10000	<40
TRANS-1,3-DICHLOROPROPENE	UG/L	<1	<5000	<20
2-HEXANONE (MBK)	UG/L	<10	<50000	<200
1,1,2-TRICHLOROETHANE	UG/L	<1	<5000	<20
TETRACHLOROETHENE	UG/L	<1	<5000	410
DIBROMOCHLOROMETHANE	UG/L	<1	<5000	<20
CHLOROBENZENE	UG/L	<1	<5000	<20
ETHYLBENZENE	UG/L	<1	<5000	<20
XYLENES (TOTAL)	UG/L	<1	<5000	<20
STYRENE	UG/L	<1	<5000	<20
BROMOFORM	UG/L	<5	<25000	<100
1,1,2,2-TETRACHLOROETHANE	UG/L	<1	<5000	<20
SURROGATES				
1,2-DICHLOROETHANE-D4	%	105	96	92
TOLUENE-D8	%	103	104	97
BFB	%	100	98	98

AnalyticalTechnologies,Inc.

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

Method : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)
Client : SIMON-EEI INC.
Project # : 512-345
Project Name: (NONE)

WATER
ATI I.D.: 106484

Sample	Parameters	Units	Results
1	NONE DETECTED	N/A	N/A
2	NONE DETECTED	N/A	N/A
3	NONE DETECTED	N/A	N/A

AnalyticalTechnologies, Inc.

GAS CHROMATOGRAPHY/MASS SPECTROSCOPY RESULTS

Test : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)
Client : SIMON-EEI INC.
Project # : 512-345
Project Name: (NONE)

ATI I.D. : 106484

Sample #	Client ID	Matrix	Date Sampled	Date Extracted	Date Analyzed	Dil. Factor
4	OW-3	WATER	25-JUN-91	N/A	03-JUL-91	20.00
5	OW-4	WATER	25-JUN-91	N/A	03-JUL-91	50.00
6	OW-5	WATER	25-JUN-91	N/A	03-JUL-91	200.00

Parameter	Units	4	5	6
CHLOROMETHANE	UG/L	<200	<500	<2000
VINYL CHLORIDE	UG/L	<20	<50	<200
BROMOMETHANE	UG/L	<200	<500	<2000
CHLOROETHANE	UG/L	<20	<50	<200
ACETONE	UG/L	<400	<1000	<4000
1,1-DICHLOROETHENE	UG/L	<20	<50	<200
METHYLENE CHLORIDE	UG/L	<100	<250	<1000
CARBON DISULFIDE	UG/L	<20	<50	<200
TRANS-1,2-DICHLOROETHENE	UG/L	<20	<50	<200
VINYL ACETATE	UG/L	<200	<500	<2000
1,1-DICHLOROETHANE	UG/L	<20	<50	<200
CIS-1,2-DICHLOROETHENE	UG/L	<20	360	900
CHLOROFORM	UG/L	<20	<50	<200
2-BUTANONE (MEK)	UG/L	<400	<1000	<4000
1,1,1-TRICHLOROETHANE	UG/L	<20	<50	<200
CARBON TETRACHLORIDE	UG/L	<20	<50	<200
1,2-DICHLOROETHANE	UG/L	<20	<50	<200
BENZENE	UG/L	<20	<50	<200
TRICHLOROETHENE	UG/L	1900	7800	15000
1,2-DICHLOROPROPANE	UG/L	<20	<50	<200
BROMODICHLOROMETHANE	UG/L	<20	<50	<200
4-METHYL-2-PENTANONE (MIBK)	UG/L	<200	<500	<2000
CIS-1,3-DICHLOROPROPENE	UG/L	<20	<50	<200
TOLUENE	UG/L	<40	<100	<400
TRANS-1,3-DICHLOROPROPENE	UG/L	<20	<50	<200
2-HEXANONE (MBK)	UG/L	<200	<500	<2000
1,1,2-TRICHLOROETHANE	UG/L	<20	<50	<200
TETRACHLOROETHENE	UG/L	270	1000	6600
DIBROMOCHLOROMETHANE	UG/L	<20	<50	<200
CHLOROBENZENE	UG/L	<20	<50	<200
ETHYLBENZENE	UG/L	<20	<50	<200
XYLENES (TOTAL)	UG/L	<20	<50	<200
STYRENE	UG/L	<20	<50	<200
BROMOFORM	UG/L	<100	<250	<1000
1,1,2,2-TETRACHLOROETHANE	UG/L	<20	<50	<200
SURROGATES				
1,2-DICHLOROETHANE-D4	%	91	94	99
TOLUENE-D8	%	98	98	100
BFB	%	98	99	99

AnalyticalTechnologies,Inc.

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

Method : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)
Client : SIMON-EEI INC.
Project # : 512-345
Project Name: (NONE)

WATER
ATI I.D.: 106484

Sample	Parameters	Units	Results
4	NONE DETECTED	N/A	N/A
5	NONE DETECTED	N/A	N/A
6	NONE DETECTED	N/A	N/A

AnalyticalTechnologies,Inc.

GAS CHROMATOGRAPHY/MASS SPECTROSCOPY RESULTS

Test : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)
Client : SIMON-EEI INC.
Project # : 512-345
Project Name: (NONE)

ATI I.D. : 106484

Sample #	Client ID	Matrix	Date Sampled	Date Extracted	Date Analyzed	Dil. Factor
7	OW-6	WATER	25-JUN-91	N/A	03-JUL-91	200.00
8	OW-100 (OW-2)	WATER	25-JUN-91	N/A	03-JUL-91	20.00

Parameter	Units	7	8
CHLOROMETHANE	UG/L	<2000	<200
VINYL CHLORIDE	UG/L	<200	<20
BROMOMETHANE	UG/L	<2000	<200
CHLOROETHANE	UG/L	<200	<20
ACETONE	UG/L	<4000	<400
1,1-DICHLOROETHENE	UG/L	<200	<20
METHYLENE CHLORIDE	UG/L	<1000	<100
CARBON DISULFIDE	UG/L	<200	<20
TRANS-1,2-DICHLOROETHENE	UG/L	<200	<20
VINYL ACETATE	UG/L	<2000	<200
1,1-DICHLOROETHANE	UG/L	<200	<20
CIS-1,2-DICHLOROETHENE	UG/L	<200	<20
CHLOROFORM	UG/L	<200	<20
2-BUTANONE (MEK)	UG/L	<4000	<400
1,1,1-TRICHLOROETHANE	UG/L	<200	<20
CARBON TETRACHLORIDE	UG/L	<200	<20
1,2-DICHLOROETHANE	UG/L	<200	<20
BENZENE	UG/L	<200	<20
TRICHLOROETHENE	UG/L	22000	2700
1,2-DICHLOROPROPANE	UG/L	<200	<20
BROMODICHLOROMETHANE	UG/L	<200	<20
4-METHYL-2-PENTANONE (MIBK)	UG/L	<2000	<200
CIS-1,3-DICHLOROPROPENE	UG/L	<200	<20
TOLUENE	UG/L	<400	<40
TRANS-1,3-DICHLOROPROPENE	UG/L	<200	<20
2-HEXANONE (MBK)	UG/L	<2000	<200
1,1,2-TRICHLOROETHANE	UG/L	<200	<20
TETRACHLOROETHENE	UG/L	10000	390
DIBROMOCHLOROMETHANE	UG/L	<200	<20
CHLOROBENZENE	UG/L	<200	<20
ETHYLBENZENE	UG/L	<200	<20
XYLENES (TOTAL)	UG/L	<200	<20
STYRENE	UG/L	<200	<20
BROMOFORM	UG/L	<1000	<100
1,1,2,2-TETRACHLOROETHANE	UG/L	<200	<20
SURROGATES			
1,2-DICHLOROETHANE-D4	%	117	96
TOLUENE-D8	%	100	100
BFB	%	98	98

AnalyticalTechnologies,Inc.

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

Method : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)
Client : SIMON-EEI INC.
Project # : 512-345
Project Name: (NONE)

WATER
ATI I.D.: 106484

Sample	Parameters	Units	Results
7	NONE DETECTED	N/A	N/A
8	NONE DETECTED	N/A	N/A

Analytical Technologies, inc.

GAS CHROMATOGRAPHY/MASS SPECTROSCOPY - QUALITY CONTROL

REAGENT BLANK

Test : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)
Blank I.D. : 13204
Client : SIMON-EEI INC.
Project # : 512-345
Project Name: (NONE)

ATI I.D. : 106484
Date Extracted: N/A
Date Analyzed : 02-JUL-91
Dil. Factor : 1.00

Parameters	Units	Results
CHLOROMETHANE	UG/L	<10
VINYL CHLORIDE	UG/L	<1
BROMOMETHANE	UG/L	<10
CHLOROETHANE	UG/L	<1
ACETONE	UG/L	<20
1,1-DICHLOROETHENE	UG/L	<1
METHYLENE CHLORIDE	UG/L	<5
CARBON DISULFIDE	UG/L	<1
TRANS-1,2-DICHLOROETHENE	UG/L	<1
VINYL ACETATE	UG/L	<10
1,1-DICHLOROETHANE	UG/L	<1
CIS-1,2-DICHLOROETHENE	UG/L	<1
CHLOROFORM	UG/L	<1
2-BUTANONE (MEK)	UG/L	<20
1,1,1-TRICHLOROETHANE	UG/L	<1
CARBON TETRACHLORIDE	UG/L	<1
1,2-DICHLOROETHANE	UG/L	<1
BENZENE	UG/L	<1
TRICHLOROETHENE	UG/L	<1
1,2-DICHLOROPROPANE	UG/L	<1
BROMODICHLOROMETHANE	UG/L	<1
4-METHYL-2-PENTANONE (MIBK)	UG/L	<10
CIS-1,3-DICHLOROPROPENE	UG/L	<1
TOLUENE	UG/L	<2
TRANS-1,3-DICHLOROPROPENE	UG/L	<1
2-HEXANONE (MBK)	UG/L	<10
1,1,2-TRICHLOROETHANE	UG/L	<1
TETRACHLOROETHENE	UG/L	<1
DIBROMOCHLOROMETHANE	UG/L	<1
CHLOROBENZENE	UG/L	<1
ETHYLBENZENE	UG/L	<1
XYLENES (TOTAL)	UG/L	<1
STYRENE	UG/L	<1
BROMOFORM	UG/L	<5
1,1,2,2-TETRACHLOROETHANE	UG/L	<1
SURROGATES		
1,2-DICHLOROETHANE-D4	%	89
TOLUENE-D8	%	98
BFB	%	95

AnalyticalTechnologies,Inc.

GAS CHROMATOGRAPHY/MASS SPECTROSCOPY - QUALITY CONTROL

REAGENT BLANK
ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

Test : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)
Blank I.D. : 13204
Client : SIMON-EEI INC.
Project # : 512-345
Project Name: (NONE)

ATI I.D. : 106484

Parameters	Units	Results
NONE DETECTED	N/A	N/A

AnalyticalTechnologies,Inc.

GAS CHROMATOGRAPHY/MASS SPECTROSCOPY - QUALITY CONTROL

REAGENT BLANK

Test : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)
Blank I.D. : 13205
Client : SIMON-EEI INC.
Project # : 512-345
Project Name: (NONE)

ATI I.D. : 106484
Date Extracted: N/A
Date Analyzed : 03-JUL-91
Dil. Factor : 1.00

Parameters	Units	Results
CHLOROMETHANE	UG/L	<10
VINYL CHLORIDE	UG/L	<1
BROMOMETHANE	UG/L	<10
CHLOROETHANE	UG/L	<1
ACETONE	UG/L	<20
1,1-DICHLOROETHENE	UG/L	<1
METHYLENE CHLORIDE	UG/L	5 TR
CARBON DISULFIDE	UG/L	<1
TRANS-1,2-DICHLOROETHENE	UG/L	<1
VINYL ACETATE	UG/L	<10
1,1-DICHLOROETHANE	UG/L	<1
CIS-1,2-DICHLOROETHENE	UG/L	<1
CHLOROFORM	UG/L	<1
2-BUTANONE (MEK)	UG/L	<20
1,1,1-TRICHLOROETHANE	UG/L	<1
CARBON TETRACHLORIDE	UG/L	<1
1,2-DICHLOROETHANE	UG/L	<1
BENZENE	UG/L	<1
TRICHLOROETHENE	UG/L	<1
1,2-DICHLOROPROPANE	UG/L	<1
BROMODICHLOROMETHANE	UG/L	<1
4-METHYL-2-PENTANONE (MIBK)	UG/L	<10
CIS-1,3-DICHLOROPROPENE	UG/L	<1
TOLUENE	UG/L	<2
TRANS-1,3-DICHLOROPROPENE	UG/L	<1
2-HEXANONE (MBK)	UG/L	<10
1,1,2-TRICHLOROETHANE	UG/L	<1
TETRACHLOROETHENE	UG/L	<1
DIBROMOCHLOROMETHANE	UG/L	<1
CHLOROBENZENE	UG/L	<1
ETHYLBENZENE	UG/L	<1
XYLENES (TOTAL)	UG/L	<1
STYRENE	UG/L	<1
BROMOFORM	UG/L	<5
1,1,2,2-TETRACHLOROETHANE	UG/L	<1
SURROGATES		
1,2-DICHLOROETHANE-D4	%	89
TOLUENE-D8	%	100
BFB	%	95

TR COMPOUND DETECTED AT AN UNQUANTIFIABLE TRACE LEVEL

AnalyticalTechnologies,Inc.

GAS CHROMATOGRAPHY/MASS SPECTROSCOPY - QUALITY CONTROL

REAGENT BLANK
ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

Test : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)
Blank I.D. : 13205
Client : SIMON-EEI INC.
Project # : 512-345
Project Name: (NONE)

ATI I.D. : 106484

Parameters	Units	Results
NONE DETECTED	N/A	N/A

AnalyticalTechnologies,Inc.

GAS CHROMATOGRAPHY/MASS SPECTROSCOPY - QUALITY CONTROL

REAGENT BLANK

Test : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)
Blank I.D. : 13257
Client : SIMON-EEI INC.
Project # : 512-345
Project Name: (NONE)

ATI I.D. : 106484
Date Extracted: N/A
Date Analyzed : 03-JUL-91
Dil. Factor : 1.00

Parameters	Units	Results
CHLOROMETHANE	UG/L	<10
VINYL CHLORIDE	UG/L	<1
BROMOMETHANE	UG/L	<10
CHLOROETHANE	UG/L	<1
ACETONE	UG/L	<20
1,1-DICHLOROETHENE	UG/L	<1
METHYLENE CHLORIDE	UG/L	<5
CARBON DISULFIDE	UG/L	<1
TRANS-1,2-DICHLOROETHENE	UG/L	<1
VINYL ACETATE	UG/L	<10
1,1-DICHLOROETHANE	UG/L	<1
CIS-1,2-DICHLOROETHENE	UG/L	<1
CHLOROFORM	UG/L	<1
2-BUTANONE (MEK)	UG/L	<20
1,1,1-TRICHLOROETHANE	UG/L	<1
CARBON TETRACHLORIDE	UG/L	<1
1,2-DICHLOROETHANE	UG/L	<1
BENZENE	UG/L	<1
TRICHLOROETHENE	UG/L	<1
1,2-DICHLOROPROPANE	UG/L	<1
BROMODICHLOROMETHANE	UG/L	<1
4-METHYL-2-PENTANONE (MIBK)	UG/L	<10
CIS-1,3-DICHLOROPROPENE	UG/L	<1
TOLUENE	UG/L	<2
TRANS-1,3-DICHLOROPROPENE	UG/L	<1
2-HEXANONE (MBK)	UG/L	<10
1,1,2-TRICHLOROETHANE	UG/L	<1
TETRACHLOROETHENE	UG/L	<1
DIBROMOCHLOROMETHANE	UG/L	<1
CHLOROBENZENE	UG/L	<1
ETHYLBENZENE	UG/L	<1
XYLENES (TOTAL)	UG/L	<1
STYRENE	UG/L	<1
BROMOFORM	UG/L	<5
1,1,2,2-TETRACHLOROETHANE	UG/L	<1
<u>SURROGATES</u>		
1,2-DICHLOROETHANE-D4	%	103
TOLUENE-D8	%	98
BFB	%	97

AnalyticalTechnologies,Inc.

GAS CHROMATOGRAPHY/MASS SPECTROSCOPY - QUALITY CONTROL

REAGENT BLANK
ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

Test : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)
Blank I.D. : 13257
Client : SIMON-EEI INC.
Project # : 512-345
Project Name: (NONE)

ATI I.D. : 106484

Parameters	Units	Results
NONE DETECTED	N/A	N/A

AnalyticalTechnologies,Inc.

GAS CHROMATOGRAPHY/MASS SPECTROSCOPY - QUALITY CONTROL

MSMSD

Test : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)
MSMSD # : 17820
Client : SIMON-EEI INC.

Project # : 512-345
Project Name: (NONE)

ATI I.D. : 106484
Date Extracted: N/A
Date Analyzed : 03-JUL-91
Sample Matrix : WATER
REF I.D. : 106484-01

Parameters	Units	Sample Result	Conc Spike	Spiked Sample	% Rec	Dup Spike	Dup % Rec	RPD
1,1-DICHLOROETHENE	UG/L	<1	40	40	100	37	93	8
BENZENE	UG/L	<1	50	51	102	50	100	2
TRICHLOROETHENE	UG/L	<1	45	46	102	45	100	2
TOLUENE	UG/L	<2	50	53	106	54	108	2
CHLOROBENZENE	UG/L	<1	50	55	110	56	112	2

% Recovery = (Spike Sample Result - Sample Result)*100/Spike Concentration
RPD (Relative % Difference) = (Spiked Sample Result - Duplicate Spike Result)*100/Average Result

AnalyticalTechnologies, Inc.

GAS CHROMATOGRAPHY/MASS SPECTROSCOPY - QUALITY CONTROL

BLANK SPIKE

Test : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)
Blank Spike #: 14711
Client : SIMON-EEI INC.
Project # : 512-345
Project Name : (NONE)

ATI I.D. : 106484
Date Extracted: N/A
Date Analyzed : 02-JUL-91
Sample Matrix : WATER

Parameters	Units	Blank Result	Spiked Sample	Spike Conc.	% Rec
1,1-DICHLOROETHENE	UG/L	<1	40	40	100
BENZENE	UG/L	<1	50	50	100
TRICHLOROETHENE	UG/L	<1	44	45	98
TOLUENE	UG/L	<2	52	50	104
CHLOROBENZENE	UG/L	<1	54	50	108

% Recovery = (Spike Sample Result - Sample Result)*100/Spike Concentration
RPD (Relative % Difference) = (Spiked Sample - Blank Result)*100/Average Result

AnalyticalTechnologies,Inc.

GAS CHROMATOGRAPHY/MASS SPECTROSCOPY - QUALITY CONTROL

BLANK SPIKE

Test : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)
Blank Spike #: 14713
Client : SIMON-EEI INC.
Project # : 512-345
Project Name : (NONE)

ATI I.D. : 106484
Date Extracted: N/A
Date Analyzed : 03-JUL-91
Sample Matrix : WATER

Parameters	Units	Blank Result	Spiked Sample	Spike Conc.	% Rec
1,1-DICHLOROETHENE	UG/L	<1	38	40	95
BENZENE	UG/L	<1	51	50	102
TRICHLOROETHENE	UG/L	<1	44	45	98
TOLUENE	UG/L	<2	55	50	110
CHLOROBENZENE	UG/L	<1	56	50	112

% Recovery = (Spike Sample Result - Sample Result)*100/Spike Concentration
RPD (Relative % Difference) = (Spiked Sample - Blank Result)*100/Average Result

AnalyticalTechnologies,Inc.

GAS CHROMATOGRAPHY/MASS SPECTROSCOPY - QUALITY CONTROL

BLANK SPIKE

Test : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)
Blank Spike #: 14742
Client : SIMON-EEI INC.
Project # : 512-345
Project Name : (NONE)

ATI I.D. : 106484
Date Extracted: N/A
Date Analyzed : 03-JUL-91
Sample Matrix : WATER

Parameters	Units	Blank Result	Spiked Sample	Spike Conc.	% Rec
1,1-DICHLOROETHENE	UG/L	<1	40	40	100
BENZENE	UG/L	<1	52	50	104
TRICHLOROETHENE	UG/L	<1	46	45	102
TOLUENE	UG/L	<2	53	50	106
CHLOROBENZENE	UG/L	<1	57	50	114

% Recovery = (Spike Sample Result - Sample Result)*100/Spike Concentration
RPD (Relative % Difference) = (Spiked Sample - Blank Result)*100/Average Result

AnalyticalTechnologies,Inc.

GAS CHROMATOGRAPHY/MASS SPECTROSCOPY RESULTS

Test : EPA 8270 (GC/MS FOR SEMIVOLATILE ORGANICS)
Client : SIMON-EEI INC.
Project # : 512-345
Project Name: (NONE)

ATI I.D. : 106484

Sample #	Client ID	Matrix	Date Sampled	Date Extracted	Date Analyzed	Dil. Factor
1	OW-00	WATER	25-JUN-91	28-JUN-91	04-JUL-91	1.00
2	OW-1	WATER	25-JUN-91	09-JUL-91	20-JUL-91	1.00
3	OW-2	WATER	25-JUN-91	28-JUN-91	04-JUL-91	1.00

Parameter	Units	1	2	3
N-NITROSODIMETHYLAMINE	UG/L	<10	<10	<10
PHENOL	UG/L	<10	<10	<10
ANILINE	UG/L	<10	<10	<10
BIS(2-CHLOROETHYL)ETHER	UG/L	<10	<10	<10
2-CHLOROPHENOL	UG/L	<10	<10	<10
1,3-DICHLOROBENZENE	UG/L	<10	<10	<10
1,4-DICHLOROBENZENE	UG/L	<10	<10	<10
BENZYL ALCOHOL	UG/L	<10	<10	<10
1,2-DICHLOROBENZENE	UG/L	<10	<10	<10
2-METHYLPHENOL	UG/L	<10	<10	<10
BIS(2-CHLOROISOPROPYL)ETHER	UG/L	<10	<10	<10
4-METHYLPHENOL	UG/L	<10	<10	<10
N-NITROSO-DI-N-PROPYLAMINE	UG/L	<10	<10	<10
HEXACHLOROETHANE	UG/L	<10	<10	<10
NITROBENZENE	UG/L	<10	<10	<10
ISOPHORONE	UG/L	<10	<10	<10
2-NITROPHENOL	UG/L	<10	<10	<10
2,4-DIMETHYLPHENOL	UG/L	<10	<10	<10
BENZOIC ACID	UG/L	<50	<50	<50
BIS(2-CHLOROETHOXY)METHANE	UG/L	<10	<10	<10
2,4-DICHLOROPHENOL	UG/L	<10	<10	<10
1,2,4-TRICHLOROBENZENE	UG/L	<10	<10	<10
NAPHTHALENE	UG/L	<10	<10	<10
4-CHLOROANILINE	UG/L	<10	<10	<10
HEXACHLOROBUTADIENE	UG/L	<10	<10	<10
4-CHLORO-3-METHYLPHENOL	UG/L	<10	<10	<10
2-METHYLNAPHTHALENE	UG/L	<10	<10	<10
HEXACHLOROCYCLOPENTADIENE	UG/L	<10	<10	<10
2,4,6-TRICHLOROPHENOL	UG/L	<10	<10	<10
2,4,5-TRICHLOROPHENOL	UG/L	<50	<50	<50
2-CHLORONAPHTHALENE	UG/L	<10	<10	<10
2-NITROANILINE	UG/L	<50	<50	<50
DIMETHYLPHTHALATE	UG/L	<10	<10	<10
ACENAPHTHYLENE	UG/L	<10	<10	<10
2,6-DINITROTOLUENE	UG/L	<10	<10	<10
3-NITROANILINE	UG/L	<50	<50	<50
ACENAPHTHENE	UG/L	<10	<10	<10
2,4-DINITROPHENOL	UG/L	<50	<50	<50

NOTE: SAMPLE 106484-02 WAS RE-EXTRACTED 09-JUL-91 OUTSIDE ITS HOLDING TIME. THE SAMPLE WAS RE-EXTRACTED BECAUSE THREE SURROGATES WERE OUT OF CONTROL. NO HITS WERE DETECTED IN EITHER EXTRACTION, THEREFORE THE RESULTS ARE UNAFFECTED.

AnalyticalTechnologies,Inc.

GAS CHROMATOGRAPHY/MASS SPECTROSCOPY RESULTS

Test : EPA 8270 (GC/MS FOR SEMIVOLATILE ORGANICS)
Client : SIMON-EEI INC.
Project # : 512-345
Project Name: (NONE)

ATI I.D. : 106484

Sample #	Client ID	Matrix	Date Sampled	Date Extracted	Date Analyzed	Dil. Factor
1	OW-00	WATER	25-JUN-91	28-JUN-91	04-JUL-91	1.00
2	OW-1	WATER	25-JUN-91	28-JUN-91	20-JUL-91	1.00
3	OW-2	WATER	25-JUN-91	28-JUN-91	04-JUL-91	1.00

Parameter	Units	1	2	3
4-NITROPHENOL	UG/L	<50	<50	<50
DIBENZOFURAN	UG/L	<10	<10	<10
2,4-DINITROTOLUENE	UG/L	<10	<10	<10
DIETHYLPHTHALATE	UG/L	<10	<10	<10
4-CHLOROPHENYL-PHENYLETHER	UG/L	<10	<10	<10
FLUORENE	UG/L	<10	<10	<10
4-NITROANILINE	UG/L	<50	<50	<50
2-METHYL-4,6-DINITROPHENOL	UG/L	<50	<50	<50
N-NITROSODIPHENYLAMINE	UG/L	<10	<10	<10
4-BROMOPHENYL-PHENYLETHER	UG/L	<10	<10	<10
HEXACHLOROBENZENE	UG/L	<10	<10	<10
PENTACHLOROPHENOL	UG/L	<50	<50	<50
PHENANTHRENE	UG/L	<10	<10	<10
ANTHRACENE	UG/L	<10	<10	<10
DI-N-BUTYLPHTHALATE	UG/L	<10	<10	<10
FLUORANTHENE	UG/L	<10	<10	<10
PYRENE	UG/L	<10	<10	<10
BUTYLBENZYLPHTHALATE	UG/L	<10	<10	<10
3,3'-DICHLOROBENZIDINE	UG/L	<20	<20	<20
BENZO(a)ANTHRACENE	UG/L	<10	<10	<10
CHRYSENE	UG/L	<10	<10	<10
BIS(2-ETHYLHEXYL)PHTHALATE	UG/L	<10	<10	<10
DI-N-OCTYLPHTHALATE	UG/L	<10	<10	<10
BENZO(b)FLUORANTHENE	UG/L	<10	<10	<10
BENZO(k)FLUORANTHENE	UG/L	<10	<10	<10
BENZO(a)PYRENE	UG/L	<10	<10	<10
INDENO(1,2,3-cd)PYRENE	UG/L	<10	<10	<10
DIBENZ(a,h)ANTHRACENE	UG/L	<10	<10	<10
BENZO(g,h,i)PERYLENE	UG/L	<10	<10	<10
<u>SURROGATES</u>				
NITROBENZENE-D5	%	83	7*H	69
2-FLUOROBIPHENYL	%	94	81	81
TERPHENYL-D14	%	122	126	82
PHENOL-D6	%	90	69	67
2-FLUOROPHENOL	%	81	67	69
2,4,6-TRIBROMOPHENOL	%	71	114	72

*H RESULT OUTSIDE OF LIMITS DUE TO SAMPLE MATRIX INTERFERENCE

AnalyticalTechnologies,Inc.

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

Method : EPA 8270 (GC/MS FOR SEMIVOLATILE ORGANICS)
Client : SIMON-EEI INC.
Project # : 512-345
Project Name: (NONE)

WATER
ATI I.D.: 106484

Sample	Parameters	Units	Results
1	NONE DETECTED	N/A	N/A
2	7.53 BENZENE DIMETHYL ISOMER	UG/L	8.0*J
	21.68 UNKNOWN HYDROCARBON	UG/L	12*J
3	NONE DETECTED	N/A	N/A

*J ESTIMATED VALUE

AnalyticalTechnologies,Inc.

GAS CHROMATOGRAPHY/MASS SPECTROSCOPY RESULTS

Test : EPA 8270 (GC/MS FOR SEMIVOLATILE ORGANICS)
Client : SIMON-EEI INC. ATI I.D. : 106484
Project # : 512-345
Project Name: (NONE)

Sample #	Client ID	Matrix	Date Sampled	Date Extracted	Date Analyzed	Dil. Factor
4	OW-3	WATER	25-JUN-91	28-JUN-91	04-JUL-91	1.00
5	OW-4	WATER	25-JUN-91	28-JUN-91	04-JUL-91	1.00
6	OW-5	WATER	25-JUN-91	28-JUN-91	04-JUL-91	1.00

Parameter	Units	4	5	6
N-NITROSODIMETHYLAMINE	UG/L	<10	<10	<10
PHENOL	UG/L	<10	<10	<10
ANILINE	UG/L	<10	<10	<10
BIS(2-CHLOROETHYL)ETHER	UG/L	<10	<10	<10
2-CHLOROPHENOL	UG/L	<10	<10	<10
1,3-DICHLOROBENZENE	UG/L	<10	<10	<10
1,4-DICHLOROBENZENE	UG/L	<10	<10	<10
BENZYL ALCOHOL	UG/L	<10	<10	<10
1,2-DICHLOROBENZENE	UG/L	<10	<10	<10
2-METHYLPHENOL	UG/L	<10	<10	<10
BIS(2-CHLOROISOPROPYL)ETHER	UG/L	<10	<10	<10
4-METHYLPHENOL	UG/L	<10	<10	<10
N-NITROSO-DI-N-PROPYLAMINE	UG/L	<10	<10	<10
HEXACHLOROETHANE	UG/L	<10	<10	<10
NITROBENZENE	UG/L	<10	<10	<10
ISOPHORONE	UG/L	<10	<10	<10
2-NITROPHENOL	UG/L	<10	<10	<10
2,4-DIMETHYLPHENOL	UG/L	<10	<10	<10
BENZOIC ACID	UG/L	<50	<50	<50
BIS(2-CHLOROETHOXY)METHANE	UG/L	<10	<10	<10
2,4-DICHLOROPHENOL	UG/L	<10	<10	<10
1,2,4-TRICHLOROBENZENE	UG/L	<10	<10	<10
NAPHTHALENE	UG/L	<10	<10	<10
4-CHLOROANILINE	UG/L	<10	<10	<10
HEXACHLOROBUTADIENE	UG/L	<10	<10	<10
4-CHLORO-3-METHYLPHENOL	UG/L	<10	<10	<10
2-METHYLNAPHTHALENE	UG/L	<10	<10	<10
HEXACHLOROCYCLOPENTADIENE	UG/L	<10	<10	<10
2,4,6-TRICHLOROPHENOL	UG/L	<10	<10	<10
2,4,5-TRICHLOROPHENOL	UG/L	<50	<50	<50
2-CHLORONAPHTHALENE	UG/L	<10	<10	<10
2-NITROANILINE	UG/L	<50	<50	<50
DIMETHYLPHTHALATE	UG/L	<10	<10	<10
ACENAPHTHYLENE	UG/L	<10	<10	<10
2,6-DINITROTOLUENE	UG/L	<10	<10	<10
3-NITROANILINE	UG/L	<50	<50	<50
ACENAPHTHENE	UG/L	<10	<10	<10
2,4-DINITROPHENOL	UG/L	<50	<50	<50

AnalyticalTechnologies,Inc.

GAS CHROMATOGRAPHY/MASS SPECTROSCOPY RESULTS

Test : EPA 8270 (GC/MS FOR SEMIVOLATILE ORGANICS)
Client : SIMON-EEI INC.
Project # : 512-345
Project Name: (NONE)

ATI I.D. : 106484

Sample #	Client ID	Matrix	Date Sampled	Date Extracted	Date Analyzed	Dil. Factor
4	OW-3	WATER	25-JUN-91	28-JUN-91	04-JUL-91	1.00
5	OW-4	WATER	25-JUN-91	28-JUN-91	04-JUL-91	1.00
6	OW-5	WATER	25-JUN-91	28-JUN-91	04-JUL-91	1.00

Parameter	Units	4	5	6
4-NITROPHENOL	UG/L	<50	<50	<50
DIBENZOFURAN	UG/L	<10	<10	<10
2,4-DINITROTOLUENE	UG/L	<10	<10	<10
DIETHYLPHTHALATE	UG/L	<10	<10	<10
4-CHLOROPHENYL-PHENYLETHER	UG/L	<10	<10	<10
FLUORENE	UG/L	<10	<10	<10
4-NITROANILINE	UG/L	<50	<50	<50
2-METHYL-4,6-DINITROPHENOL	UG/L	<50	<50	<50
N-NITROSODIPHENYLAMINE	UG/L	<10	<10	<10
4-BROMOPHENYL-PHENYLETHER	UG/L	<10	<10	<10
HEXACHLOROBENZENE	UG/L	<10	<10	<10
PENTACHLOROPHENOL	UG/L	<50	<50	<50
PHENANTHRENE	UG/L	<10	<10	<10
ANTHRACENE	UG/L	<10	<10	<10
DI-N-BUTYLPHTHALATE	UG/L	<10	<10	<10
FLUORANTHENE	UG/L	<10	<10	<10
PYRENE	UG/L	<10	<10	<10
BUTYLBENZYLPHTHALATE	UG/L	<10	<10	<10
3,3'-DICHLOROBENZIDINE	UG/L	<20	<20	<20
BENZO(a)ANTHRACENE	UG/L	<10	<10	<10
CHRYSENE	UG/L	<10	<10	<10
BIS(2-ETHYLHEXYL)PHTHALATE	UG/L	<10	<10	<10
DI-N-OCTYLPHTHALATE	UG/L	<10	<10	<10
BENZO(b)FLUORANTHENE	UG/L	<10	<10	<10
BENZO(k)FLUORANTHENE	UG/L	<10	<10	<10
BENZO(a)PYRENE	UG/L	<10	<10	<10
INDENO(1,2,3-cd)PYRENE	UG/L	<10	<10	<10
DIBENZ(a,h)ANTHRACENE	UG/L	<10	<10	<10
BENZO(g,h,i)PERYLENE	UG/L	<10	<10	<10
<u>SURROGATES</u>				
NITROBENZENE-D5	%	69	61	57
2-FLUOROBIPHENYL	%	84	74	67
TERPHENYL-D14	%	88	92	81
PHENOL-D6	%	67	71	71
2-FLUOROPHENOL	%	68	71	72
2,4,6-TRIBROMOPHENOL	%	64	67	77

AnalyticalTechnologies,Inc.

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

Method : EPA 8270 (GC/MS FOR SEMIVOLATILE ORGANICS)
Client : SIMON-EEI INC.
Project # : 512-345
Project Name: (NONE)

WATER
ATI I.D.: 106484

Sample	Parameters	Units	Results
4	NONE DETECTED	N/A	N/A
5	NONE DETECTED	N/A	N/A
6	NONE DETECTED	N/A	N/A

Analytical Technologies, Inc.

GAS CHROMATOGRAPHY/MASS SPECTROSCOPY RESULTS

Test : EPA 8270 (GC/MS FOR SEMIVOLATILE ORGANICS)
Client : SIMON-EEI INC.
Project # : 512-345
Project Name: (NONE)

ATI I.D. : 106484

Sample #	Client ID	Matrix	Date Sampled	Date Extracted	Date Analyzed	Dil. Factor
7	OW-6	WATER	25-JUN-91	28-JUN-91	04-JUL-91	1.00
8	OW-100	WATER	25-JUN-91	28-JUN-91	04-JUL-91	1.00

Parameter	Units	7	8
N-NITROSODIMETHYLAMINE	UG/L	<10	<10
PHENOL	UG/L	<10	<10
ANILINE	UG/L	<10	<10
BIS(2-CHLOROETHYL)ETHER	UG/L	<10	<10
2-CHLOROPHENOL	UG/L	<10	<10
1,3-DICHLOROBENZENE	UG/L	<10	<10
1,4-DICHLOROBENZENE	UG/L	<10	<10
BENZYL ALCOHOL	UG/L	<10	<10
1,2-DICHLOROBENZENE	UG/L	<10	<10
2-METHYLPHENOL	UG/L	<10	<10
BIS(2-CHLOROISOPROPYL)ETHER	UG/L	<10	<10
4-METHYLPHENOL	UG/L	<10	<10
N-NITROSO-DI-N-PROPYLAMINE	UG/L	<10	<10
HEXACHLOROETHANE	UG/L	<10	<10
NITROBENZENE	UG/L	<10	<10
ISOPHORONE	UG/L	<10	<10
2-NITROPHENOL	UG/L	<10	<10
2,4-DIMETHYLPHENOL	UG/L	<10	<10
BENZOIC ACID	UG/L	<50	<50
BIS(2-CHLOROETHOXY)METHANE	UG/L	<10	<10
2,4-DICHLOROPHENOL	UG/L	<10	<10
1,2,4-TRICHLOROBENZENE	UG/L	<10	<10
NAPHTHALENE	UG/L	<10	<10
4-CHLOROANILINE	UG/L	<10	<10
HEXACHLOROBUTADIENE	UG/L	<10	<10
4-CHLORO-3-METHYLPHENOL	UG/L	<10	<10
2-METHYLNAPHTHALENE	UG/L	<10	<10
HEXACHLOROCYCLOPENTADIENE	UG/L	<10	<10
2,4,6-TRICHLOROPHENOL	UG/L	<10	<10
2,4,5-TRICHLOROPHENOL	UG/L	<50	<50
2-CHLORONAPHTHALENE	UG/L	<10	<10
2-NITROANILINE	UG/L	<50	<50
DIMETHYLPHTHALATE	UG/L	<10	<10
ACENAPHTHYLENE	UG/L	<10	<10
2,6-DINITROTOLUENE	UG/L	<10	<10
3-NITROANILINE	UG/L	<50	<50
ACENAPHTHENE	UG/L	<10	<10
2,4-DINITROPHENOL	UG/L	<50	<50

AnalyticalTechnologies,Inc.

GAS CHROMATOGRAPHY/MASS SPECTROSCOPY RESULTS

Test : EPA 8270 (GC/MS FOR SEMIVOLATILE ORGANICS)
Client : SIMON-EEI INC.
Project # : 512-345
Project Name: (NONE)

ATI I.D. : 106484

Sample #	Client ID	Matrix	Date Sampled	Date Extracted	Date Analyzed	Dil. Factor
7	OW-6	WATER	25-JUN-91	28-JUN-91	04-JUL-91	1.00
8	OW-100	WATER	25-JUN-91	28-JUN-91	04-JUL-91	1.00

Parameter	Units	7	8
4-NITROPHENOL	UG/L	<50	<50
DIBENZOFURAN	UG/L	<10	<10
2,4-DINITROTOLUENE	UG/L	<10	<10
DIETHYLPHTHALATE	UG/L	<10	<10
4-CHLOROPHENYL-PHENYLETHER	UG/L	<10	<10
FLUORENE	UG/L	<10	<10
4-NITROANILINE	UG/L	<50	<50
2-METHYL-4,6-DINITROPHENOL	UG/L	<50	<50
N-NITROSODIPHENYLAMINE	UG/L	<10	<10
4-BROMOPHENYL-PHENYLETHER	UG/L	<10	<10
HEXACHLOROBENZENE	UG/L	<10	<10
PENTACHLOROPHENOL	UG/L	<50	<50
PHENANTHRENE	UG/L	<10	<10
ANTHRACENE	UG/L	<10	<10
DI-N-BUTYLPHTHALATE	UG/L	<10	<10
FLUORANTHENE	UG/L	<10	<10
PYRENE	UG/L	<10	<10
BUTYLBENZYLPHTHALATE	UG/L	<10	<10
3,3'-DICHLOROBENZIDINE	UG/L	<20	<20
BENZO(a)ANTHRACENE	UG/L	<10	<10
CHRYSENE	UG/L	<10	<10
BIS(2-ETHYLHEXYL)PHTHALATE	UG/L	<10	<10
DI-N-OCTYLPHTHALATE	UG/L	<10	<10
BENZO(b)FLUORANTHENE	UG/L	<10	<10
BENZO(k)FLUORANTHENE	UG/L	<10	<10
BENZO(a)PYRENE	UG/L	<10	<10
INDENO(1,2,3-cd)PYRENE	UG/L	<10	<10
DIBENZ(a,h)ANTHRACENE	UG/L	<10	<10
BENZO(g,h,i)PERYLENE	UG/L	<10	<10
SURROGATES			
NITROBENZENE-D5	%	63	65
2-FLUOROBIPHENYL	%	75	79
TERPHENYL-D14	%	84	72
PHENOL-D6	%	64	57
2-FLUOROPHENOL	%	73	54
2,4,6-TRIBROMOPHENOL	%	73	59

AnalyticalTechnologies,Inc.

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

Method : EPA 8270 (GC/MS FOR SEMIVOLATILE ORGANICS)
Client : SIMON-EEI INC.
Project # : 512-345
Project Name: (NONE)

WATER
ATI I.D.: 106484

Sample	Parameters	Units	Results
7	NONE DETECTED	N/A	N/A
8	NONE DETECTED	N/A	N/A

AnalyticalTechnologies,Inc.

GAS CHROMATOGRAPHY/MASS SPECTROSCOPY - QUALITY CONTROL

REAGENT BLANK

Test : EPA 8270 (GC/MS FOR SEMIVOLATILE ORGANICS)
Blank I.D. : 13330
Client : SIMON-EEI INC.
Project # : 512-345
Project Name: (NONE)

ATI I.D. : 106484
Date Extracted: 28-JUN-91
Date Analyzed : 04-JUL-91
Dil. Factor : 1.00

Parameters	Units	Results
N-NITROSODIMETHYLAMINE	UG/L	<10
PHENOL	UG/L	<10
ANILINE	UG/L	<10
BIS(2-CHLOROETHYL)ETHER	UG/L	<10
2-CHLOROPHENOL	UG/L	<10
1,3-DICHLOROBENZENE	UG/L	<10
1,4-DICHLOROBENZENE	UG/L	<10
BENZYL ALCOHOL	UG/L	<10
1,2-DICHLOROBENZENE	UG/L	<10
2-METHYLPHENOL	UG/L	<10
BIS(2-CHLOROISOPROPYL)ETHER	UG/L	<10
4-METHYLPHENOL	UG/L	<10
N-NITROSO-DI-N-PROPYLAMINE	UG/L	<10
HEXACHLOROETHANE	UG/L	<10
NITROBENZENE	UG/L	<10
ISOPHORONE	UG/L	<10
2-NITROPHENOL	UG/L	<10
2,4-DIMETHYLPHENOL	UG/L	<10
BENZOIC ACID	UG/L	<50
BIS(2-CHLOROETHOXY)METHANE	UG/L	<10
2,4-DICHLOROPHENOL	UG/L	<10
1,2,4-TRICHLOROBENZENE	UG/L	<10
NAPHTHALENE	UG/L	<10
4-CHLOROANILINE	UG/L	<10
HEXACHLOROBUTADIENE	UG/L	<10
4-CHLORO-3-METHYLPHENOL	UG/L	<10
2-METHYLNAPHTHALENE	UG/L	<10
HEXACHLOROCYCLOPENTADIENE	UG/L	<10
2,4,6-TRICHLOROPHENOL	UG/L	<10
2,4,5-TRICHLOROPHENOL	UG/L	<50
2-CHLORONAPHTHALENE	UG/L	<10
2-NITROANILINE	UG/L	<50
DIMETHYLPHTHALATE	UG/L	<10
ACENAPHTHYLENE	UG/L	<10
2,6-DINITROTOLUENE	UG/L	<10
3-NITROANILINE	UG/L	<50
ACENAPHTHENE	UG/L	<10
2,4-DINITROPHENOL	UG/L	<50
4-NITROPHENOL	UG/L	<50
DIBENZOFURAN	UG/L	<10
2,4-DINITROTOLUENE	UG/L	<10
DIETHYLPHTHALATE	UG/L	<10
4-CHLOROPHENYL-PHENYLETHER	UG/L	<10
FLUORENE	UG/L	<10
4-NITROANILINE	UG/L	<50
2-METHYL-4,6-DINITROPHENOL	UG/L	<50

AnalyticalTechnologies,Inc.

GAS CHROMATOGRAPHY/MASS SPECTROSCOPY - QUALITY CONTROL

REAGENT BLANK

Test : EPA 8270 (GC/MS FOR SEMIVOLATILE ORGANICS)
Blank I.D. : 13330
Client : SIMON-EEI INC.
Project # : 512-345
Project Name: (NONE)

ATI I.D. : 106484
Date Extracted: 28-JUN-91
Date Analyzed : 04-JUL-91
Dil. Factor : 1.00

Parameters	Units	Results
N-NITROSODIPHENYLAMINE	UG/L	<10
4-BROMOPHENYL-PHENYLETHER	UG/L	<10
HEXACHLOROBENZENE	UG/L	<10
PENTACHLOROPHENOL	UG/L	<50
PHENANTHRENE	UG/L	<10
ANTHRACENE	UG/L	<10
DI-N-BUTYLPHTHALATE	UG/L	<10
FLUORANTHENE	UG/L	<10
PYRENE	UG/L	<10
BUTYLBENZYLPHTHALATE	UG/L	<10
3,3'-DICHLOROBENZIDINE	UG/L	<20
BENZO(a)ANTHRACENE	UG/L	<10
CHRYSENE	UG/L	<10
BIS(2-ETHYLHEXYL)PHTHALATE	UG/L	<10
DI-N-OCTYLPHTHALATE	UG/L	<10
BENZO(b)FLUORANTHENE	UG/L	<10
BENZO(k)FLUORANTHENE	UG/L	<10
BENZO(a)PYRENE	UG/L	<10
INDENO(1,2,3-cd)PYRENE	UG/L	<10
DIBENZ(a,h)ANTHRACENE	UG/L	<10
BENZO(g,h,i)PERYLENE	UG/L	<10
SURROGATES		
NITROBENZENE-D5	%	84
2-FLUOROBIPHENYL	%	94
TERPHENYL-D14	%	115
PHENOL-D6	%	59
2-FLUOROPHENOL	%	62
2,4,6-TRIBROMOPHENOL	%	54

AnalyticalTechnologies,Inc.

GAS CHROMATOGRAPHY/MASS SPECTROSCOPY - QUALITY CONTROL

REAGENT BLANK
ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

Test : EPA 8270 (GC/MS FOR SEMIVOLATILE ORGANICS)
Blank I.D. : 13330
Client : SIMON-EEI INC.
Project # : 512-345
Project Name: (NONE)

ATI I.D. : 106484

Parameters	Units	Results
NONE DETECTED	N/A	N/A

AnalyticalTechnologies,Inc.

GAS CHROMATOGRAPHY/MASS SPECTROSCOPY - QUALITY CONTROL

REAGENT BLANK

Test : EPA 8270 (GC/MS FOR SEMIVOLATILE ORGANICS)
Blank I.D. : 13606
Client : SIMON-EEI INC.
Project # : 512-345
Project Name: (NONE)

ATI I.D. : 106484
Date Extracted: 09-JUL-91
Date Analyzed : 22-JUL-91
Dil. Factor : 1.00

Parameters	Units	Results
N-NITROSODIMETHYLAMINE	UG/L	<10
PHENOL	UG/L	<10
ANILINE	UG/L	<10
BIS(2-CHLOROETHYL)ETHER	UG/L	<10
2-CHLOROPHENOL	UG/L	<10
1,3-DICHLOROBENZENE	UG/L	<10
1,4-DICHLOROBENZENE	UG/L	<10
BENZYL ALCOHOL	UG/L	<10
1,2-DICHLOROBENZENE	UG/L	<10
2-METHYLPHENOL	UG/L	<10
BIS(2-CHLOROISOPROPYL)ETHER	UG/L	<10
4-METHYLPHENOL	UG/L	<10
N-NITROSO-DI-N-PROPYLAMINE	UG/L	<10
HEXACHLOROETHANE	UG/L	<10
NITROBENZENE	UG/L	<10
ISOPHORONE	UG/L	<10
2-NITROPHENOL	UG/L	<10
2,4-DIMETHYLPHENOL	UG/L	<10
BENZOIC ACID	UG/L	<50
BIS(2-CHLOROETHOXY)METHANE	UG/L	<10
2,4-DICHLOROPHENOL	UG/L	<10
1,2,4-TRICHLOROBENZENE	UG/L	<10
NAPHTHALENE	UG/L	<10
4-CHLOROANILINE	UG/L	<10
HEXACHLOROBUTADIENE	UG/L	<10
4-CHLORO-3-METHYLPHENOL	UG/L	<10
2-METHYLNAPHTHALENE	UG/L	<10
HEXACHLOROCYCLOPENTADIENE	UG/L	<10
2,4,6-TRICHLOROPHENOL	UG/L	<10
2,4,5-TRICHLOROPHENOL	UG/L	<50
2-CHLORONAPHTHALENE	UG/L	<10
2-NITROANILINE	UG/L	<50
DIMETHYLPHTHALATE	UG/L	<10
ACENAPHTHYLENE	UG/L	<10
2,6-DINITROTOLUENE	UG/L	<10
3-NITROANILINE	UG/L	<50
ACENAPHTHENE	UG/L	<10
2,4-DINITROPHENOL	UG/L	<50
4-NITROPHENOL	UG/L	<50
DIBENZOFURAN	UG/L	<10
2,4-DINITROTOLUENE	UG/L	<10
DIETHYLPHTHALATE	UG/L	<10
4-CHLOROPHENYL-PHENYLETHER	UG/L	<10
FLUORENE	UG/L	<10
4-NITROANILINE	UG/L	<50
2-METHYL-4,6-DINITROPHENOL	UG/L	<50

AnalyticalTechnologies,Inc.

GAS CHROMATOGRAPHY/MASS SPECTROSCOPY - QUALITY CONTROL

REAGENT BLANK

Test : EPA 8270 (GC/MS FOR SEMIVOLATILE ORGANICS)
Blank I.D. : 13606
Client : SIMON-EEI INC.
Project # : 512-345
Project Name: (NONE)

ATI I.D. : 106484
Date Extracted: 09-JUL-91
Date Analyzed : 22-JUL-91
Dil. Factor : 1.00

Parameters	Units	Results
N-NITROSODIPHENYLAMINE	UG/L	<10
4-BROMOPHENYL-PHENYLETHER	UG/L	<10
HEXACHLOROBENZENE	UG/L	<10
PENTACHLOROPHENOL	UG/L	<50
PHENANTHRENE	UG/L	<10
ANTHRACENE	UG/L	<10
DI-N-BUTYLPHTHALATE	UG/L	<10
FLUORANTHENE	UG/L	<10
PYRENE	UG/L	<10
BUTYLBENZYLPHTHALATE	UG/L	<10
3,3'-DICHLOROBENZIDINE	UG/L	<20
BENZO(a)ANTHRACENE	UG/L	<10
CHRYSENE	UG/L	<10
BIS(2-ETHYLHEXYL)PHTHALATE	UG/L	<10
DI-N-OCTYLPHTHALATE	UG/L	<10
BENZO(b)FLUORANTHENE	UG/L	<10
BENZO(k)FLUORANTHENE	UG/L	<10
BENZO(a)PYRENE	UG/L	<10
INDENO(1,2,3-cd)PYRENE	UG/L	<10
DIBENZ(a,h)ANTHRACENE	UG/L	<10
BENZO(g,h,i)PERYLENE	UG/L	<10
SURROGATES		
NITROBENZENE-D5	%	51
2-FLUOROBIPHENYL	%	71
TERPHENYL-D14	%	92
PHENOL-D6	%	52
2-FLUOROPHENOL	%	107
2,4,6-TRIBROMOPHENOL	%	83

AnalyticalTechnologies,inc.

GAS CHROMATOGRAPHY/MASS SPECTROSCOPY - QUALITY CONTROL

REAGENT BLANK
ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

Test : EPA 8270 (GC/MS FOR SEMIVOLATILE ORGANICS)
Blank I.D. : 13606
Client : SIMON-EEI INC.
Project # : 512-345
Project Name: (NONE)

ATI I.D. : 106484

Parameters	Units	Results
NONE DETECTED	N/A	N/A

AnalyticalTechnologies,Inc.

GAS CHROMATOGRAPHY/MASS SPECTROSCOPY - QUALITY CONTROL

MSMSD

Test : EPA 8270 (GC/MS FOR SEMIVOLATILE ORGANICS)
MSMSD # : 18072
Client : SIMON-EEI INC.

Project # : 512-345
Project Name: (NONE)

ATI I.D. : 106484
Date Extracted: 28-JUN-91
Date Analyzed : 04-JUL-91
Sample Matrix : WATER
REF I.D. : 106484-08

Parameters	Units	Sample Result	Conc Spike	Spiked Sample	% Rec	Dup Spike	Dup % Rec	RPD
PHENOL	UG/L	<10	200	104	52	136	68	27
2-CHLOROPHENOL	UG/L	<10	200	110	55	136	68	21
1,4-DICHLOROBENZENE	UG/L	<10	100	86	86	66	66	26
N-NITROSO-DI-N-PROPYLAMINE	UG/L	<10	100	68	68	50	50	31
1,2,4-TRICHLOROBENZENE	UG/L	<10	100	94	94	72	72	27
4-CHLORO-3-METHYLPHENOL	UG/L	<10	200	58	29	110	55	62*F
ACENAPHTHENE	UG/L	<10	100	90	90	66	66	31
4-NITROPHENOL	UG/L	<50	400	334	84	406	102	19
2,4-DINITROTOLUENE	UG/L	<10	100	54	54	66	66	20
PENTACHLOROPHENOL	UG/L	<50	400	320	80	382	96	18
PYRENE	UG/L	<10	100	90	90	62	62	37*F

% Recovery = (Spike Sample Result - Sample Result)*100/Spike Concentration
RPD (Relative % Difference) = (Spiked Sample Result - Duplicate Spike Result)*100/Average Result

*F RESULT OUTSIDE OF ATI'S QUALITY CONTROL LIMITS

AnalyticalTechnologies,Inc.

GAS CHROMATOGRAPHY/MASS SPECTROSCOPY - QUALITY CONTROL

MSMSD

Test : EPA 8270 (GC/MS FOR SEMIVOLATILE ORGANICS)
MSMSD # : 18317
Client : SIMON-EEI INC.

Project # : 512-345
Project Name: (NONE)

ATI I.D. : 106484
Date Extracted: 02-JUL-91
Date Analyzed : 15-JUL-91
Sample Matrix : WATER
REF I.D. : REAGENT WATER

Parameters	Units	Sample Result	Conc Spike	Spiked Sample	% Rec	Dup Spike	Dup % Rec	RPD
PHENOL	UG/L	<10	200	130	65	140	70	7
2-CHLOROPHENOL	UG/L	<10	200	120	60	130	65	8
1,4-DICHLOROBENZENE	UG/L	<10	100	70	70	79	79	12
N-NITROSO-DI-N-PROPYLAMINE	UG/L	<10	100	58	58	66	66	13
1,2,4-TRICHLOROBENZENE	UG/L	<10	100	70	70	76	76	8
4-CHLORO-3-METHYLPHENOL	UG/L	<10	200	146	73	162	81	10
ACENAPHTHENE	UG/L	<10	100	70	70	80	80	13
4-NITROPHENOL	UG/L	<50	400	373	93	449	112	18
2,4-DINITROTOLUENE	UG/L	<10	100	66	66	82	82	22
PENTACHLOROPHENOL	UG/L	<50	400	440	110	539	135	20
PYRENE	UG/L	<10	100	74	74	86	86	15

% Recovery = (Spike Sample Result - Sample Result)*100/Spike Concentration
RPD (Relative % Difference) = (Spiked Sample Result - Duplicate Spike Result)*100/Average Result

AnalyticalTechnologies,Inc.

GAS CHROMATOGRAPHY/MASS SPECTROSCOPY - QUALITY CONTROL

BLANK SPIKE

Test : EPA 8270 (GC/MS FOR SEMIVOLATILE ORGANICS)
Blank Spike #: 14849
Client : SIMON-EEI INC.
Project # : 512-345
Project Name : (NONE)

ATI I.D. : 106484
Date Extracted: 28-JUN-91
Date Analyzed : 04-JUL-91
Sample Matrix : WATER

Parameters	Units	Blank Result	Spiked Sample	Spike Conc.	% Rec
PHENOL	UG/L	<10	150	200	75
2-CHLOROPHENOL	UG/L	<10	140	200	70
1,4-DICHLOROBENZENE	UG/L	<10	76	100	76
N-NITROSO-DI-N-PROPYLAMINE	UG/L	<10	60	100	60
1,2,4-TRICHLOROBENZENE	UG/L	<10	88	100	88
4-CHLORO-3-METHYLPHENOL	UG/L	<10	160	200	80
ACENAPHTHENE	UG/L	<10	88	100	88
4-NITROPHENOL	UG/L	<50	360	400	90
2,4-DINITROTOLUENE	UG/L	<10	74	100	74
PENTACHLOROPHENOL	UG/L	<50	352	400	88
PYRENE	UG/L	<10	100	100	100

% Recovery = (Spike Sample Result - Sample Result)*100/Spike Concentration
RPD (Relative % Difference) = (Spiked Sample - Blank Result)*100/Average Result

AnalyticalTechnologies,Inc.

GAS CHROMATOGRAPHY/MASS SPECTROSCOPY - QUALITY CONTROL

BLANK SPIKE

Test : EPA 8270 (GC/MS FOR SEMIVOLATILE ORGANICS)
Blank Spike #: 15270
Client : SIMON-EEI INC.
Project # : 512-345
Project Name : (NONE)

ATI I.D. : 106484
Date Extracted: 09-JUL-91
Date Analyzed : 22-JUL-91
Sample Matrix : WATER

Parameters	Units	Blank Result	Spiked Sample	Spike Conc.	% Rec
PHENOL	UG/L	<10	144	200	72
2-CHLOROPHENOL	UG/L	<10	140	200	70
1,4-DICHLOROBENZENE	UG/L	<10	76	100	76
N-NITROSO-DI-N-PROPYLAMINE	UG/L	<10	68	100	68
1,2,4-TRICHLOROBENZENE	UG/L	<10	95	100	95
4-CHLORO-3-METHYLPHENOL	UG/L	<10	184	200	92
ACENAPHTHENE	UG/L	<10	90	100	90
4-NITROPHENOL	UG/L	<50	400	400	100
2,4-DINITROTOLUENE	UG/L	<10	76	100	76
PENTACHLOROPHENOL	UG/L	<50	391	400	98
PYRENE	UG/L	<10	103	100	103

% Recovery = (Spike Sample Result - Sample Result)*100/Spike Concentration
RPD (Relative % Difference) = (Spiked Sample - Blank Result)*100/Average Result

EEI

106484

Simon-EEI Inc.
5882 Bolsa Ave.
Huntington Beach, CA 92649

CHAIN OF CUSTODY RECORD

LABORATORY: ATI 5550 MOREHOUSE DR SAN DIEGO, CA	PROJECT NO. 512-345
	PURCHASE ORDER NO.
	SAMPLERS:(signature) LChaidez
Phone No: 619/458-9141	Phone No. 714/891-7446
Remarks:	

ANALYSES REQUESTED

SAMPLE NO.	DATE	TIME	E240	82K											Number of Containers	REMARKS
OW-00-01	6/25/91	PM	✓												2	Send lab report
01 OW-00-02	↓	↓		✓											3	attn: Leobardo
OW-1-01			✓												2	Chaidez
02 OW-1-02				✓											3	
OW-2-01			✓												2	
3 OW-2-02				✓											3	
OW-3-01			✓												2	
04 OW-3-02				✓											3	
OW-4-01			✓												2	
5 OW-4-02		↓		✓											3	
OW-5-01	AM	AM	✓												2	
6 OW-5-02				✓											3	
OW-6-01			✓												2	
07 OW-6-02	↓	↓		✓											3	
—															—	

PINK COPY: SAMPLER RETAINS **YELLOW COPY:** LABORATORY COPY

WHITE COPY: LABORATORY SIGNS AND RETURNS WITH ANALYTICAL RESULTS

TOTAL NUMBER OF CONTAINERS 35

Relinquished by:(signature)	Received by:(signature)	Date/Time
LChaidez 6/26/91	Susan Amann	6/26/91 10:13
Susan Amann	Bob De Boy	6/26/91 11:03
[illegible]		

EEI

Simon-EEI Inc.
5882 Bolsa Ave.
Huntington Beach, CA 92649

CHAIN OF CUSTODY RECORD

LABORATORY: ATI, 8?8? Moorehouse Drive, San Diego, California	PROJECT NO. 512345
	PURCHASE ORDER NO.
	SAMPLERS:(signature) L Chaidez
	Phone No. 714/891-7446

Phone No: 619/458-9141

Remarks:

SAMPLE NO.	DATE	TIME	8240	8270	Number of Containers	REMARKS
OW-100-01	6/25/91	AM	✓		2	Send lab report
OW-100-02	"	"		✓	3	attn: Leobardo
—					—	Chaidez

PINK COPY: SAMPLER RETAINS **YELLOW COPY:** LABORATORY COPY

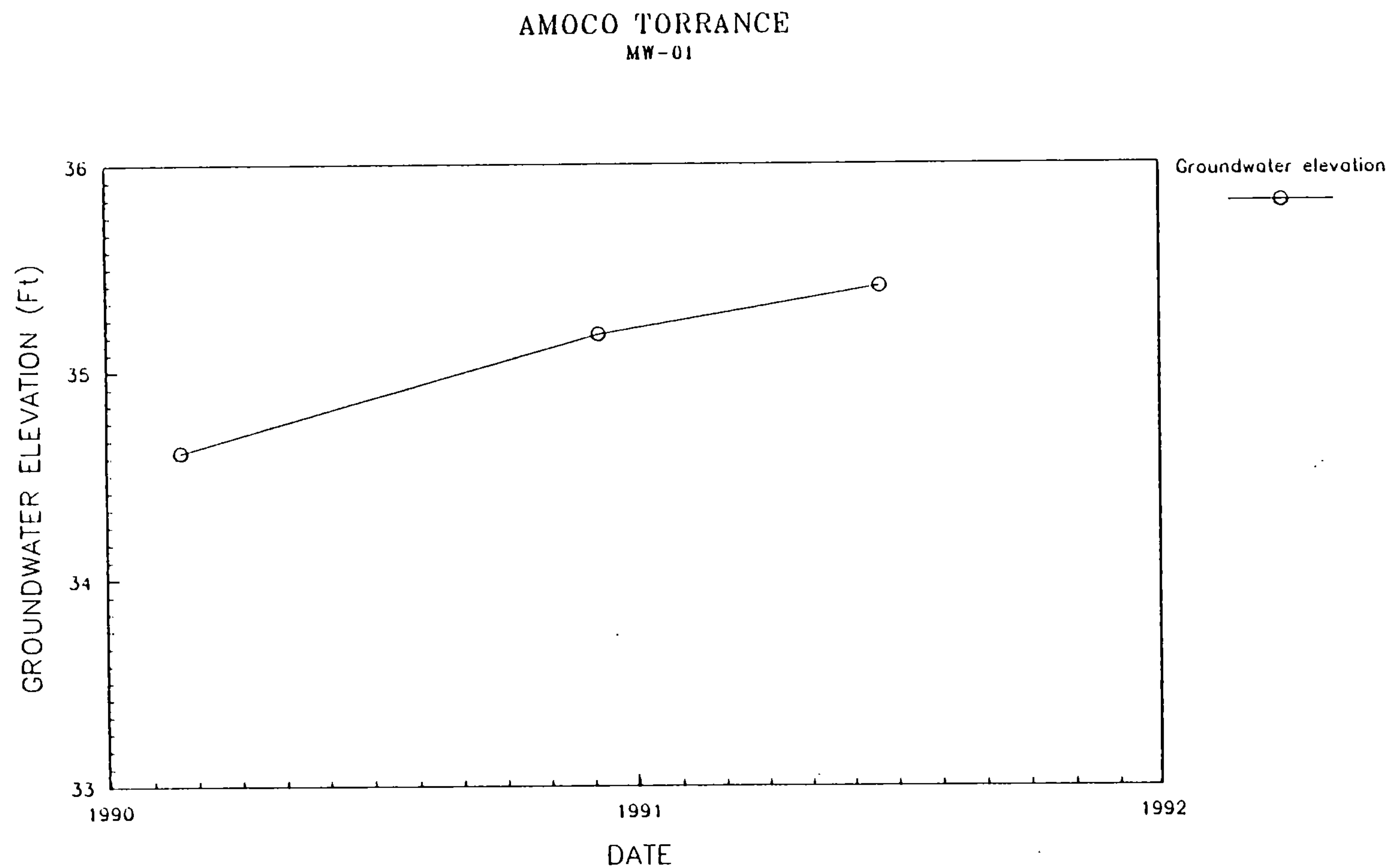
WHITE COPY: LABORATORY SIGNS AND RETURNS WITH ANALYTICAL RESULTS

TOTAL NUMBER OF CONTAINERS: 5

Relinquished by:(signature)	Received by:(signature)	Date/Time
L Chaidez 6/26/91	Susan Amann	6/26/91 10:13
Susan Amann	Bob DeFay	6/26/91 11:06 AM
Bob DeFay		
	Received for laboratory by:(signature) Marian Van Dulcey 6/26/91	6:50

APPENDIX B

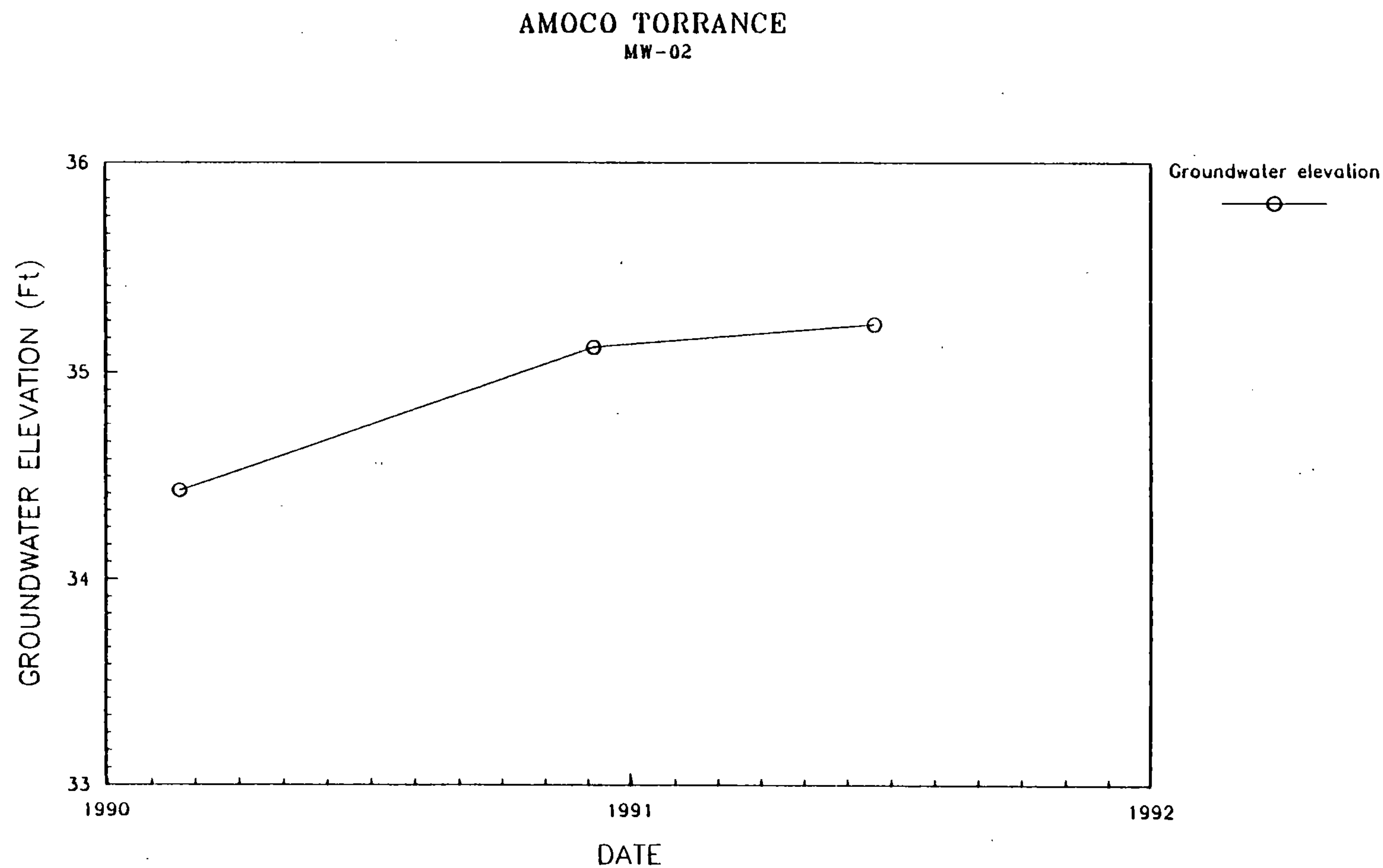
MONITORING WELL HYDROGRAPHS



MONITORING WELL HYDROGRAPH
1225 WEST 196TH STREET
TORRANCE, CALIFORNIA

SIMON-EEI Inc.

PROJECT NO: 512-345	FIGURE NO:
DATE: JUNE, 1991	



MONITORING WELL HYDROGRAPH
1225 WEST 196TH STREET
TORRANCE, CALIFORNIA

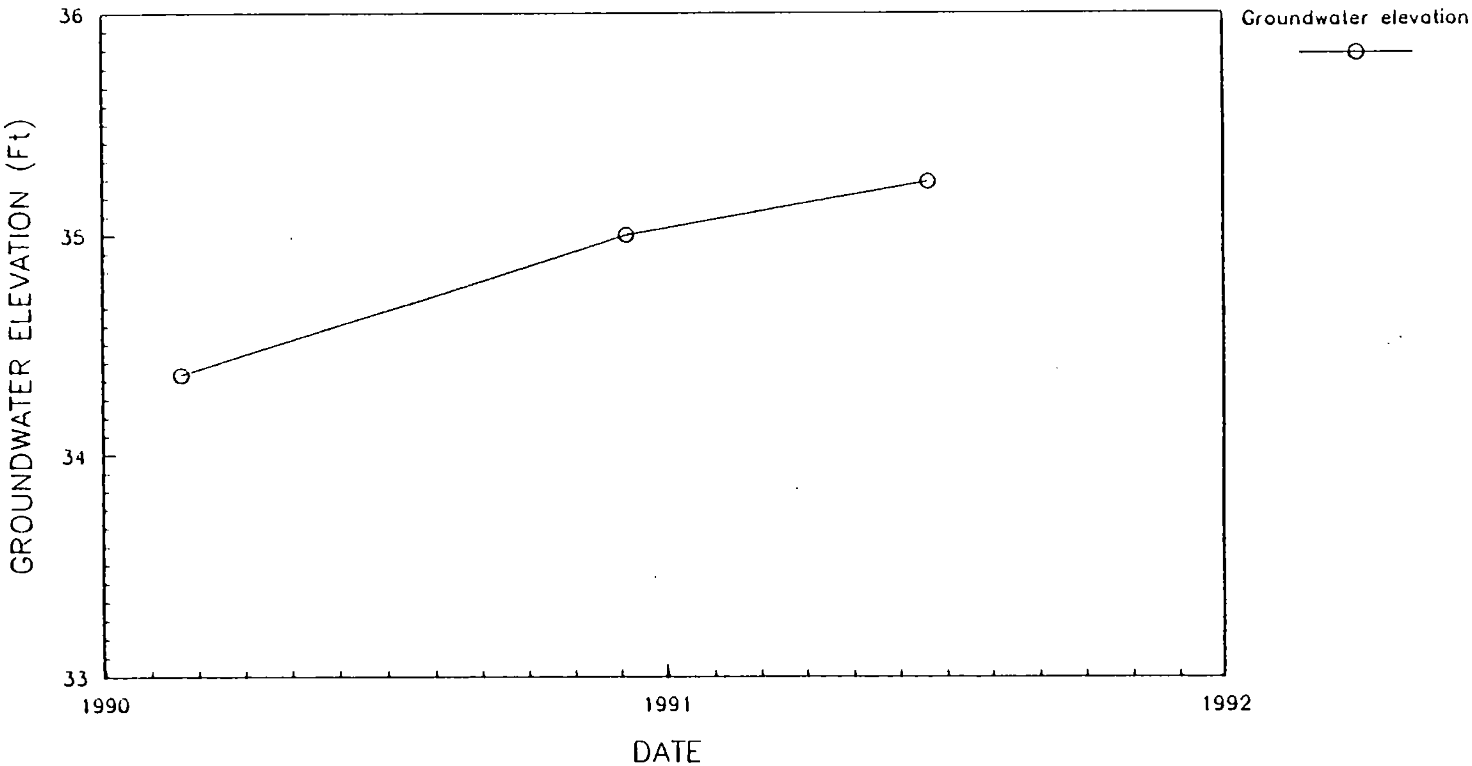
SIMON-EEI Inc.

PROJECT NO: 512-345

DATE: JUNE, 1991

FIGURE NO:

AMOCO TORRANCE
MW-03

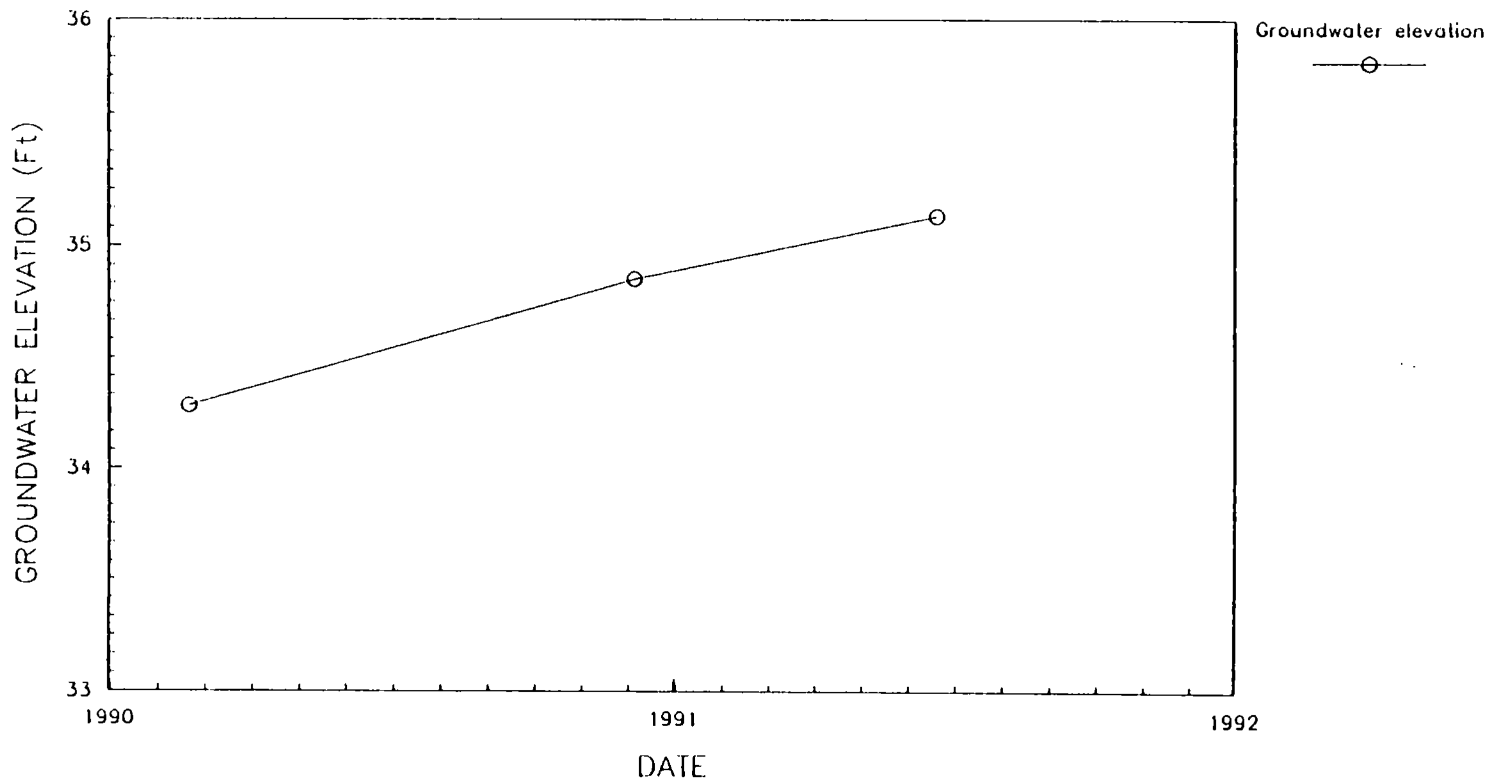


MONITORING WELL HYDROGRAPH
1225 WEST 196TH STREET
TORRANCE, CALIFORNIA

SIMON-EEI Inc.

PROJECT NO:	512-345	FIGURE NO:
DATE:	JUNE, 1991	

AMOCO TORRANCE
MW-04



MONITORING WELL HYDROGRAPH
1225 WEST 196TH STREET
TORRANCE, CALIFORNIA

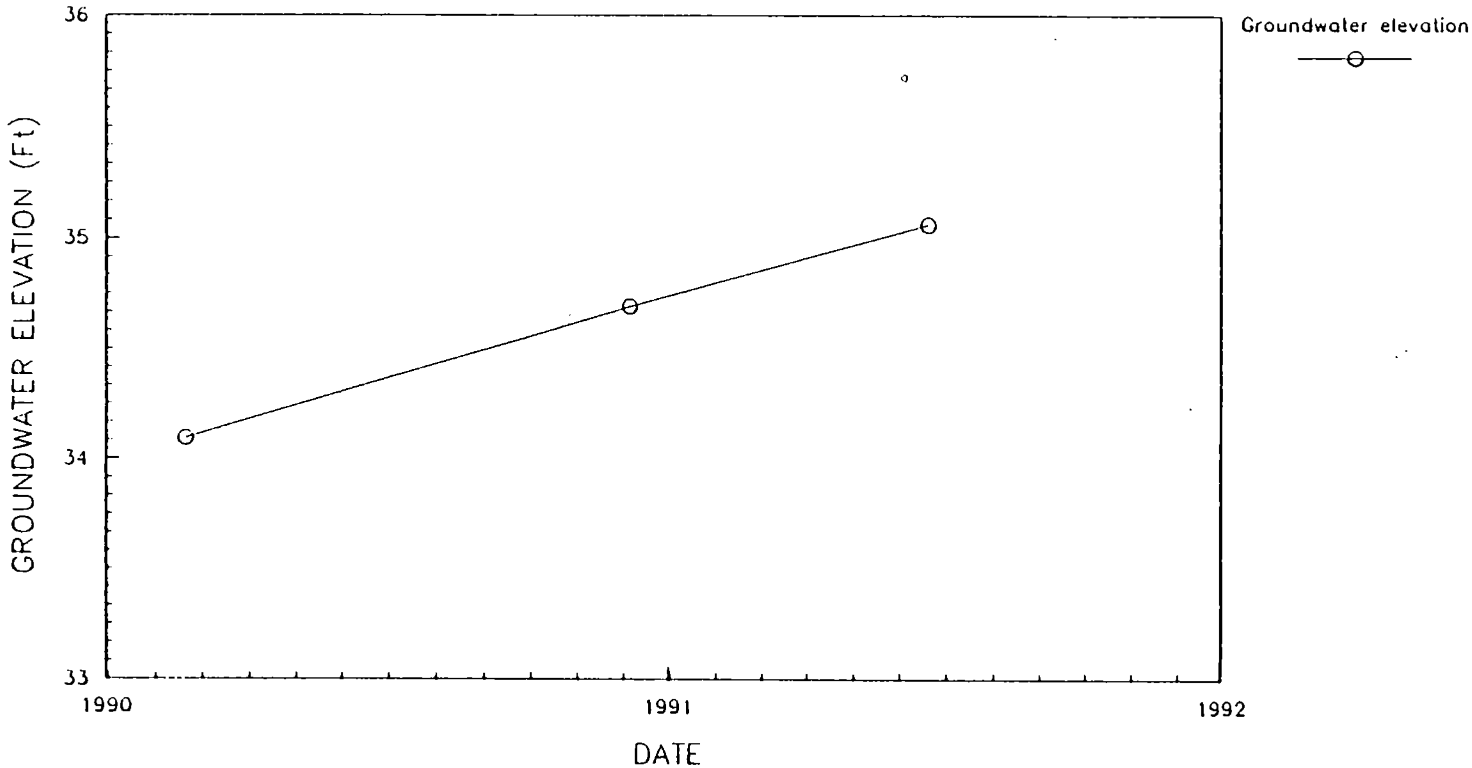
SIMON-EEI Inc.

PROJECT NO: 512-345

DATE: JUNE, 1991

FIGURE NO:

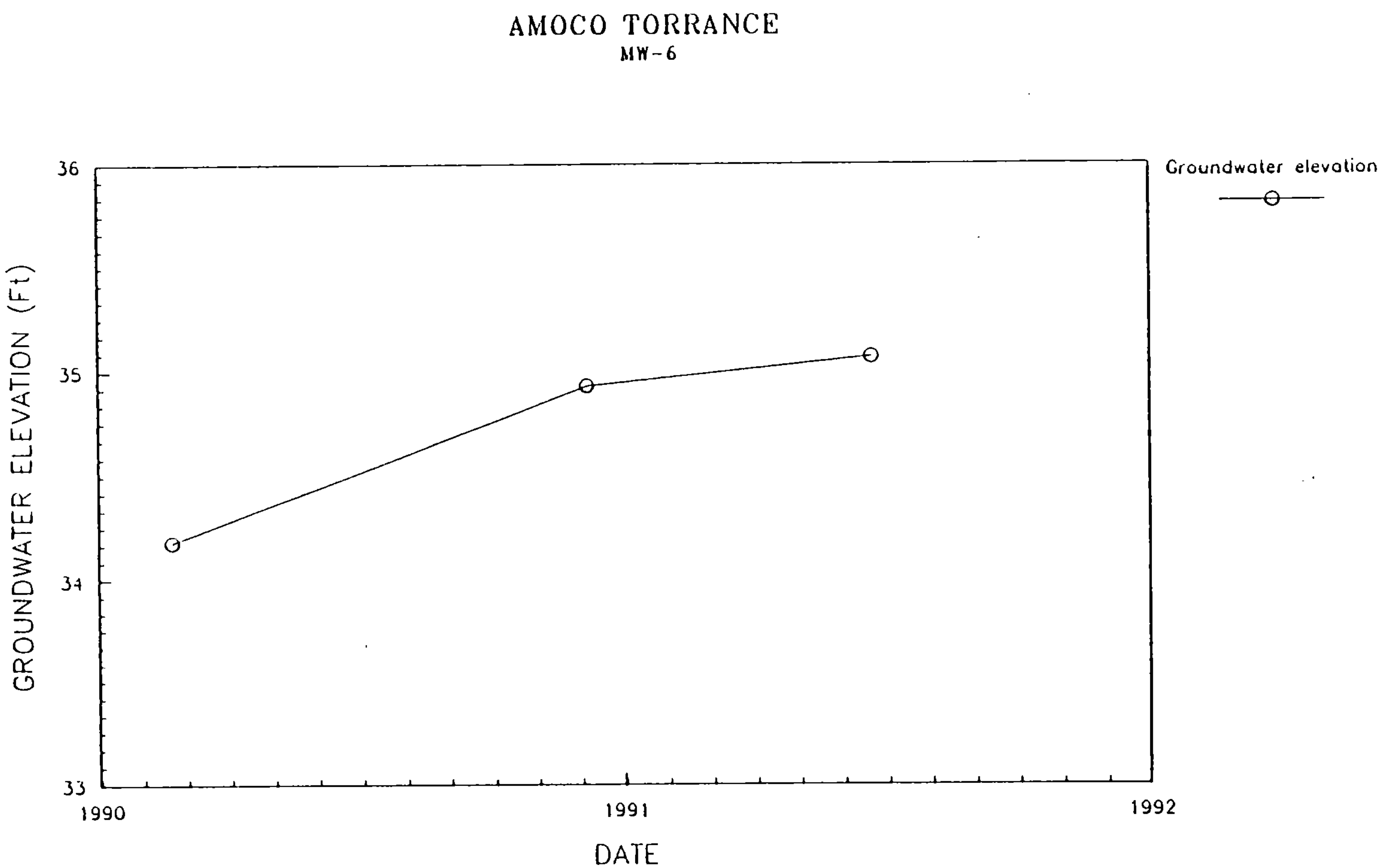
AMOCO TORRANCE
MW-5



MONITORING WELL HYDROGRAPH
1225 WEST 196TH STREET
TORRANCE, CALIFORNIA

SIMON-EEI Inc.

PROJECT NO: 512-345	FIGURE NO:
DATE: JUNE, 1991	



MONITORING WELL HYDROGRAPH
1225 WEST 196TH STREET
TORRANCE, CALIFORNIA

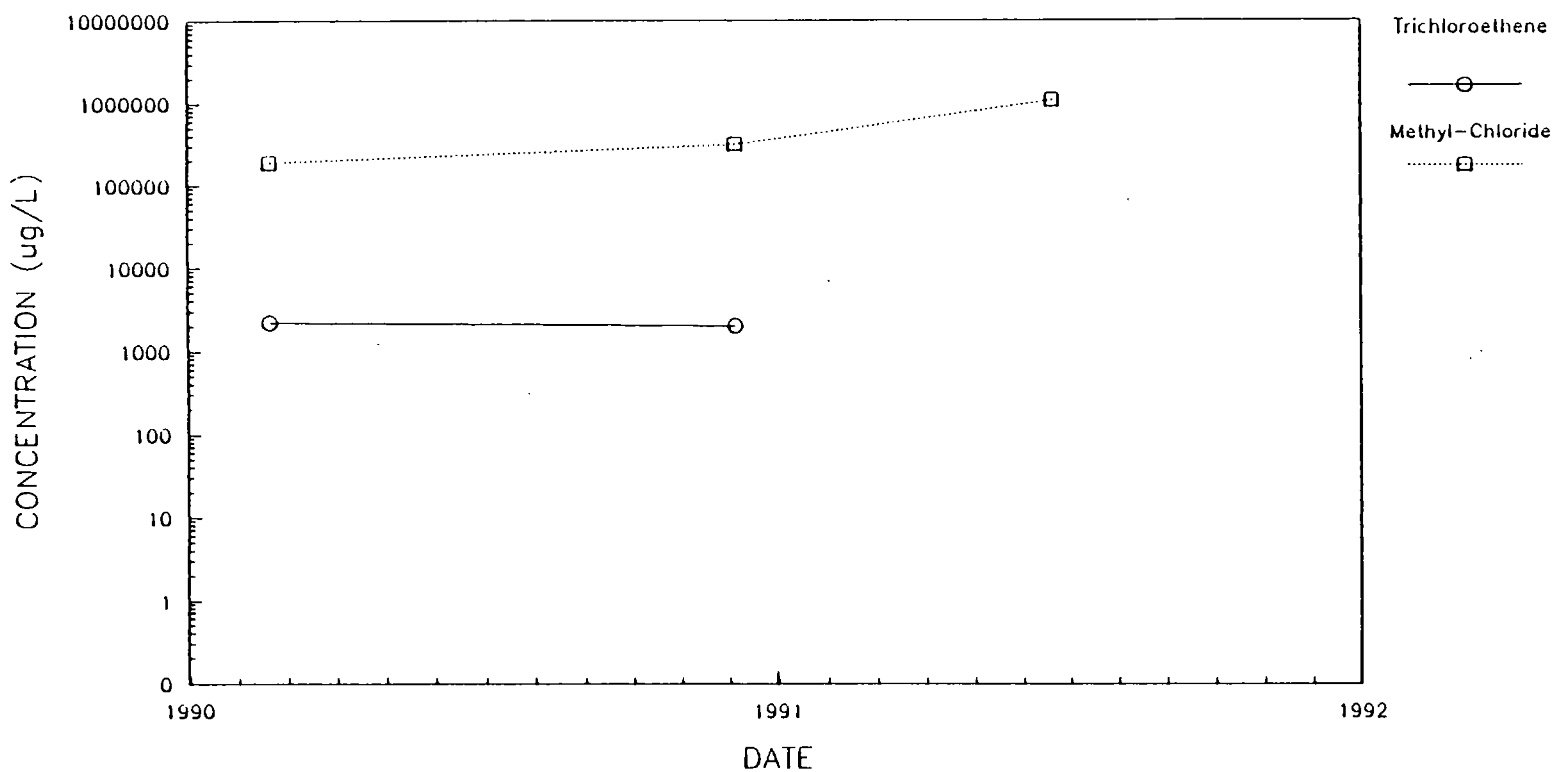
SIMON-EEI Inc.

PROJECT NO: 512-345	FIGURE NO:
DATE: JUNE, 1991	

APPENDIX C

GRAPHS OF SELECTED ORGANIC COMPOUNDS OVER TIME

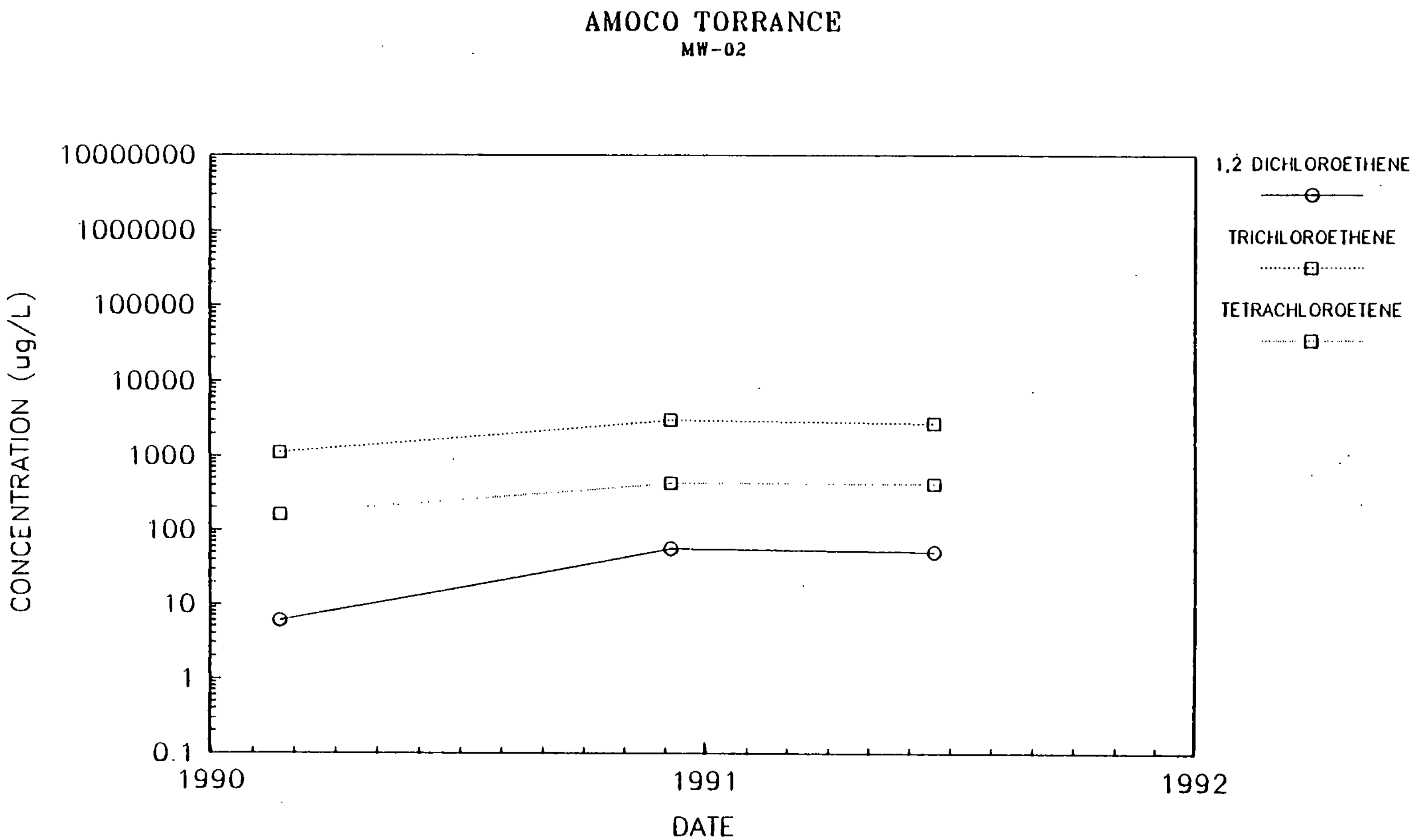
AMOCO TORRANCE
MW-01



SELECTED ORGANIC COMPOUNDS VERSUS TIME
1225 WEST 196TH STREET
TORRANCE, CALIFORNIA

SIMON—EEI Inc.

PROJECT NO: 512-345		FIGURE NO:
DATE: JUNE, 1991		

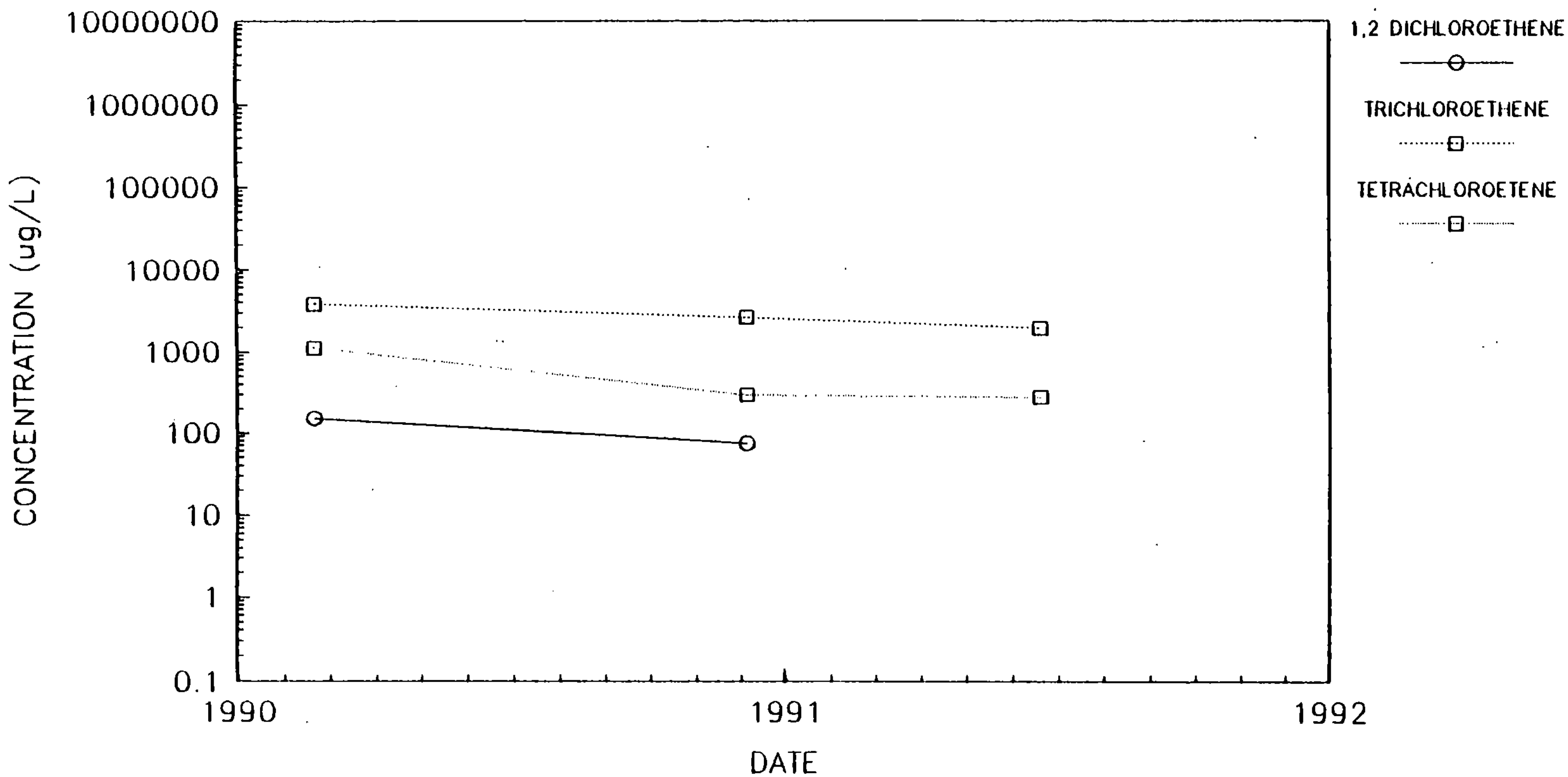


SELECTED ORGANIC COMPOUNDS VERSUS TIME
1225 WEST 196TH STREET
TORRANCE, CALIFORNIA

SIMON-EEI Inc.

PROJECT NO: 512-345	FIGURE NO:	
DATE: JUNE, 1991		

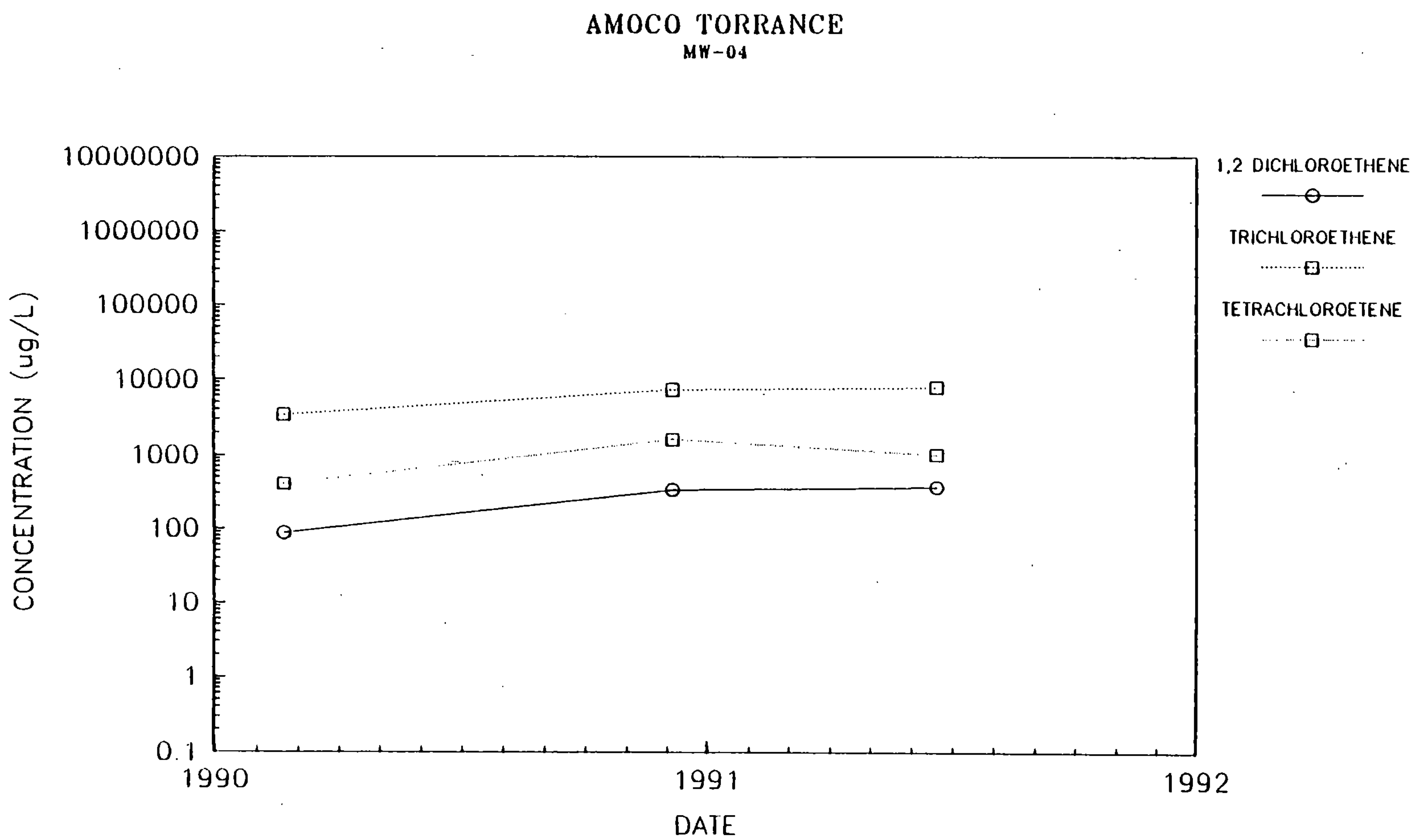
AMOCO TORRANCE
MW-03



SELECTED ORGANIC COMPOUNDS VERSUS TIME
1225 WEST 196TH STREET
TORRANCE, CALIFORNIA

SIMON-EEI Inc.

PROJECT NO: 512-345		FIGURE NO:
DATE: JUNE, 1991		

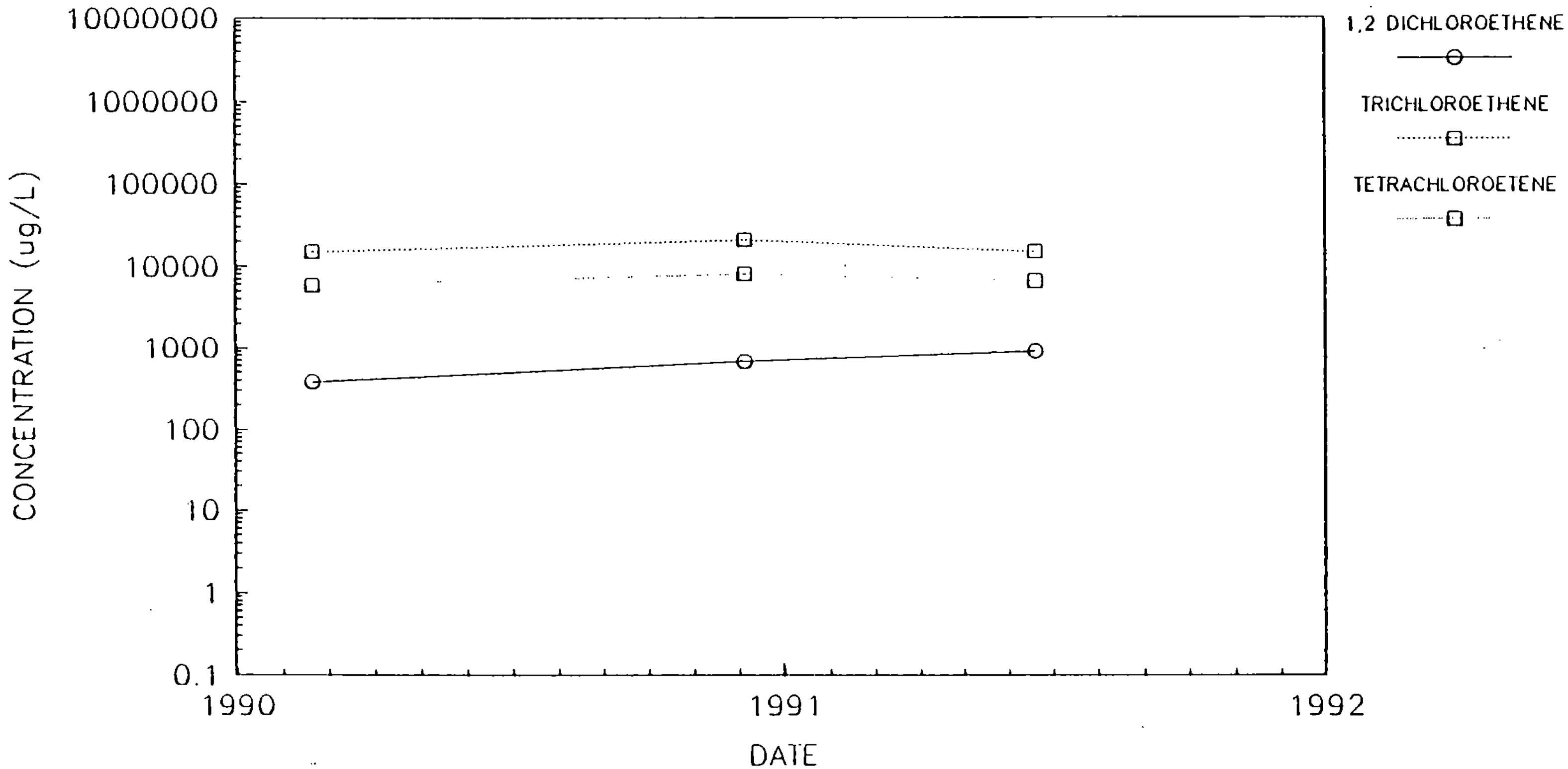


SELECTED ORGANIC COMPOUNDS VERSUS TIME
1225 WEST 196TH STREET
TORRANCE, CALIFORNIA

SIMON-EEI Inc.

PROJECT NO: 512-345		FIGURE NO:
DATE: JUNE, 1991		

AMOCO TORRANCE
MW-05



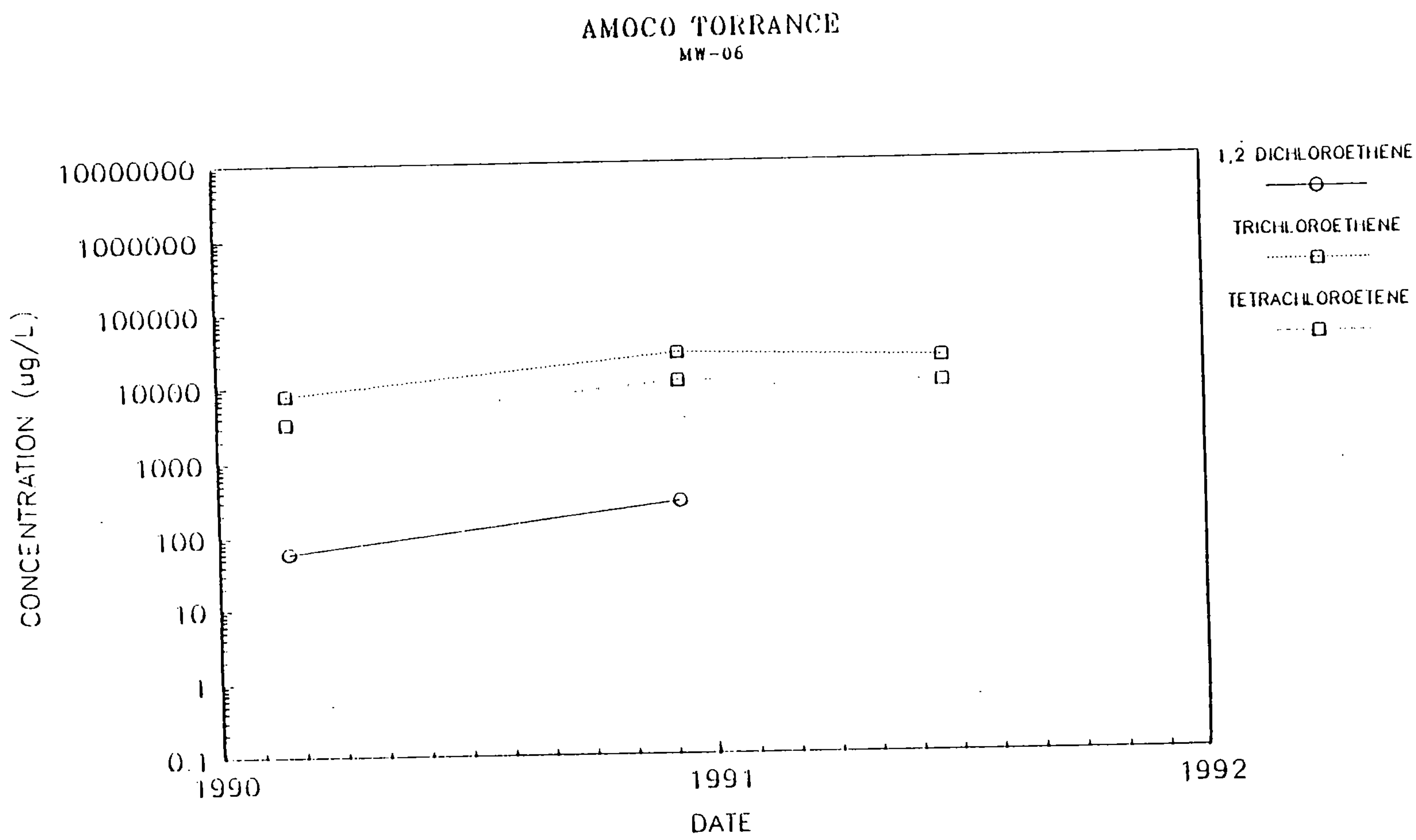
SELECTED ORGANIC COMPOUNDS VERSUS TIME
1225 WEST 196TH STREET
TORRANCE, CALIFORNIA

SIMON-EEI Inc.

PROJECT NO: 512-345

DATE: JUNE, 1991

FIGURE NO:



SELECTED ORGANIC COMPOUNDS VERSUS TIME
1225 WEST 196TH STREET
TORRANCE, CALIFORNIA

SIMON-EEI Inc.

PROJECT NO: 512-345	FIGURE NO:
DATE: JUNE, 1991	

0639-2336

JANUARY, 1992
GROUNDWATER SAMPLING
AND ANALYSIS REPORT
AMOCO CHEMICAL COMPANY
TORRANCE, CALIFORNIA

SIMON HYDRO-SEARCH

06 39-02336

JANUARY, 1992
GROUNDWATER SAMPLING
AND ANALYSIS REPORT
AMOCO CHEMICAL COMPANY
TORRANCE, CALIFORNIA

March 11, 1992

Simon Hydro-Search
5882 Bolsa Avenue
Huntington Beach, California 92649

Project No. 512-345

JANUARY, 1992
GROUNDWATER SAMPLING AND ANALYSIS REPORT
AMOCO CHEMICAL COMPANY
TORRANCE, CALIFORNIA

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JANUARY, 1992
GROUNDWATER SAMPLING AND ANALYSIS REPORT
AMOCO CHEMICAL COMPANY
TORRANCE, CALIFORNIA

1.0 INTRODUCTION

Amoco Chemical Company operates a facility at 1225 West 196th Street, Torrance, California for the conversion of styrene monomer to styrene polymer (Figure 1). The purpose of the groundwater sampling was to evaluate the concentration of volatile and semi-volatile organic compounds in water samples collected from six on site monitoring wells. This report contains the results of the January 16, 1992 sampling event performed by Simon Hydro-Search (Simon).

2.0 WORK COMPLETED

Groundwater samples from six onsite monitoring wells were collected and chemically analyzed by EPA Methods 624 and 625 for volatile and semi-volatile compounds, respectively.

The groundwater sampling methods used are discussed in Appendix B.

3.0 SITE HYDROGEOLOGY

Groundwater occurs under water table conditions at depths of 63 to 66 feet below ground surface (Table 2). Groundwater flow direction is towards the south with a gradient of approximately 0.0016 ft./ft. as shown on the water table elevation contour map (Figure 2).

4.0 GROUNDWATER LABORATORY ANALYTICAL RESULTS

Six groundwater samples plus a field blank (OW-00) and a duplicate of well OW-2 (OW-100) were analyzed by a State certified laboratory using EPA Methods 624 and 625 for volatile and semi-volatile compounds, respectively. Laboratory reports and chain-of-custody forms are included in Appendix A.

The groundwater from each of the six wells had detectable concentrations of volatile (halogenated and aromatic) organic compounds (Table 1). 1,2-dichlorobenzene was the only semi-volatile compound reported. It had a concentration of 5 ug/l in monitoring well OW-6.

Eleven halogenated compounds were detected in the groundwater samples. Five of these compounds (1,1-DCA, 1,1-DCE, cis-1,2-DCE, TCE, and PCE)[1], had concentrations that were greater then their respective CADHS MCLs[2].

Three of the eleven detected halogenated compounds (trans-1,2-DCE, 1,1,2 TCA, and trichlorofluoromethane) were detected at concentrations less than their respective CADHS MCLs.

The three remaining detected halogenated compounds are 1,2-dichlorobenzene, chloroform, and methylene chloride. The detected 1,2-dichlorobenzene concentration was less then the CADHS AL (there is no MCL set for this compound). There is no established CADHS MCL or AL for chloroform. The detected methylene chloride concentration was greater than the CADHS AL (there is no MCL set for this compound).

Four aromatic compounds, (benzene, ethylbenzene, toluene, and xylenes) were detected in the groundwater samples. The benzene concentration was greater than its MCL but the remaining three were detected at concentrations less than their applicable MCL or AL.

Groundwater concentration maps of cis-1,2-DCE, TCE, PCE, methylene chloride, and benzene are enclosed as figures 3 through 7.

[1] 1,1-DCA: 1,1-dichloroethane; 1,1-DCE: 1,1-dichloroethene; cis-1,2-DCE: cis-1,2-dichloroethene; trans-1,2-DCE: trans-1,2-dichloroethene; PCE: tetrachloroethene; 1,1,2-TCA: 1,1,2-trichloroethane, TCE: trichloroethene

[2] Maximum Contaminant Levels (MCLs) and Action Levels (ALs) for drinking water in California are established by the California Department of Health Services (CADHS). "MCLs are enforceable primary drinking water standards, adopted into regulation under the Safe Drinking Water Act, which must be met by all public drinking water systems to which they apply. They are risk-management numbers based on comprehensive risk assessments, exposure levels, analytical detection limits, feasibility of removal and removal costs. In cases where no MCL has been established, ALs serve as non-enforceable health-based guidance numbers, which are only affected by analytical detection limits. They are provided by the Department as interim guidance for "safe" levels of contaminants in drinking water". Alexis M. Milea, P.E., Standards and Technology Unit, Office of Drinking Water, California Department of Health Services, October 24, 1990.

GROUNDWATER LABORATORY ANALYTICAL RESULTS

TABLE 1

Report: JANUARY, 1992 BIANNUAL GROUNDWATER MONITORING REPORT
Client: AMOCO
Facility: AMOCO Chemical Company
Location: 1225 West 196th Street/Normandie
City: Torrance, California

SIMON Hydro-Search
Project: 512-345
Contract: NA
Date: 11-Mar-92

SAMPLE DESCRIPTION | **LABORATORY RESULTS** ND = Not Detected above limit shown, NA = Not Anaylzed, Unregulated = Monitoring Required per CADHS, Not Listed = No CADHS Levels Established

Sample Date	Well/Sample Name	Benzene EPA 624 (ug/l)	Chloroform EPA 624 (ug/l)	1,2-Dichloro benzene EPA 625 (ug/l)	1,1-Dichloro ethane EPA 624 (ug/l)	1,1-Dichloro ethene EPA 624 (ug/l)	cis-1,2-Dichloro ethene EPA 624 (ug/l)	trans-1,2-Dichloro ethene EPA 624 (ug/l)	Ethyl benzene EPA 624 (ug/l)	Methylene Chloride EPA 624 (ug/l)	Tetrachloro ethene EPA 624 (ug/l)	Toluene EPA 624 (ug/l)	1,1,2-Tri chloro ethane EPA 624 (ug/l)	Trichloro ethene EPA 624 (ug/l)	Trichloro fluoro methane EPA 624 (ug/l)	Xylenes Total EPA 624 (ug/l)	All Other Semi-Volatile Compounds EPA 625 (ug/l)	
CADHS MCL as of 18 OCT 90		1	unregulated	unregulated	5	6	6	10	680	unregulated	5	unregulated	32	5	150	1,750		
CADHS AL as of 18 OCT 90			not listed	130						40		100						
01/16/92	OW-00 field blank	ND<3	ND<3	ND<5	ND<3	ND<3	ND<3	ND<3	ND<3	ND<5	ND<3	ND<3	ND<5	ND<3	ND<10	ND<3	none detected	
01/16/92	OW-01	3	37	ND<5	ND<3	8	60	ND<3	5	1,000,000	180	4	6	2,200	ND<10	14	none detected	OW-1
01/16/92	OW-02	ND<3	11	ND<5	ND<3	ND<3	23	7	ND<3	930	460	ND<3	ND<5	2,700	17	ND<3	none detected	2
01/16/92	OW-02 Duplicate	ND<3	13	ND<5	ND<3	ND<3	24	8	ND<3	25	390	ND<3	ND<5	2,700	18	ND<3	none detected	2 dup
01/16/92	OW-03	ND<3	8	ND<5	ND<3	8	59	ND<3	ND<3	7	430	ND<3	ND<5	3,200	ND<10	ND<3	none detected	3
01/16/92	OW-04	7	19	ND<5	ND<3	33	190	ND<3	ND<3	5	1,300	ND<3	ND<5	5,500	ND<10	ND<3	none detected	4
01/16/92	OW-05	22	34	ND<5	10	150	560	ND<3	ND<3	6	5,500	ND<3	ND<5	14,000	14	ND<3	none detected	5
01/16/92	OW-06	28	69	5	11	130	300	ND<3	ND<3	ND<5	8,400	ND<3	ND<5	21,000	ND<10	ND<3	none detected	6

? ? ? ? freon?

combine?

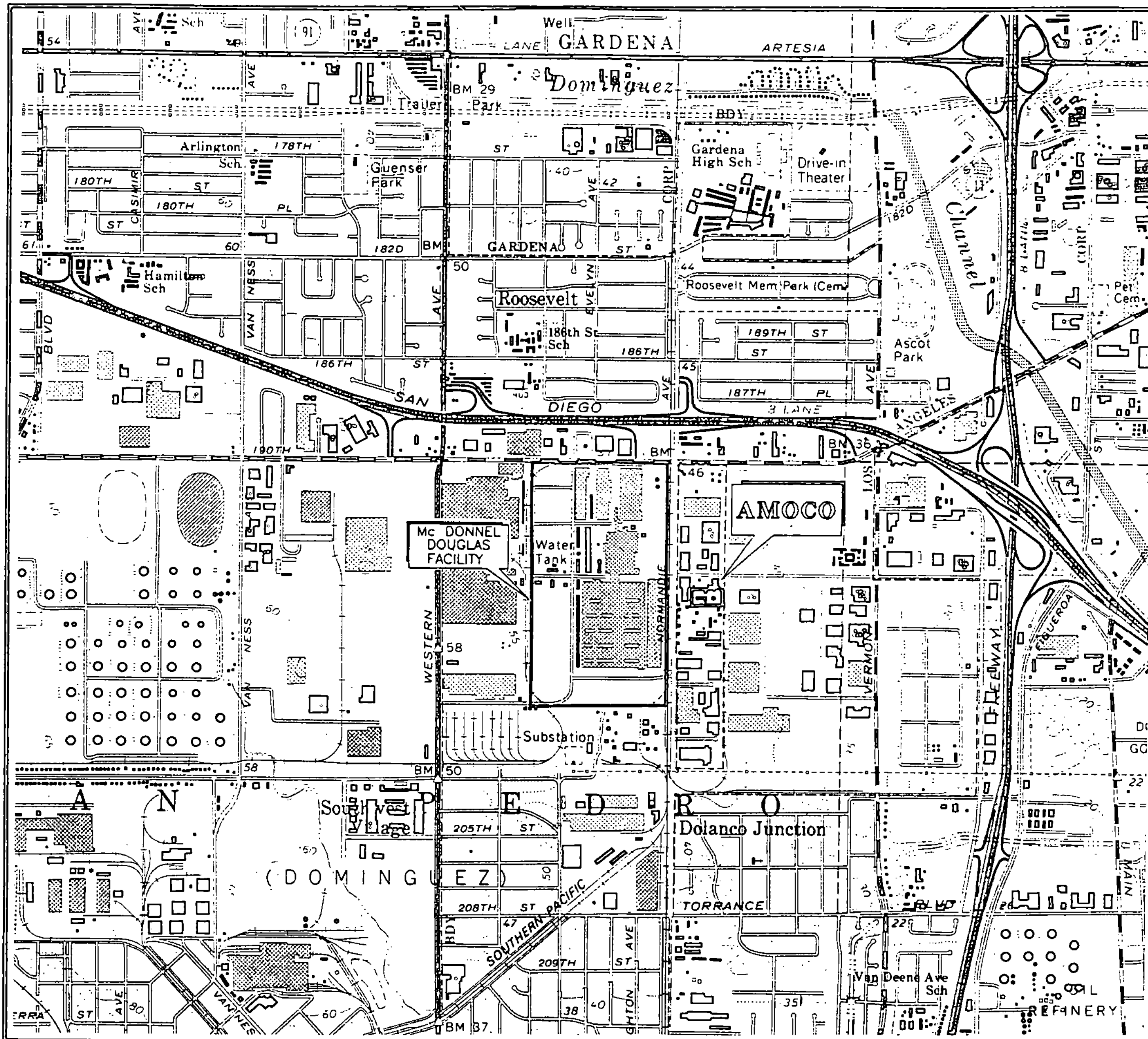
Chlorobenzene?

TABLE 2

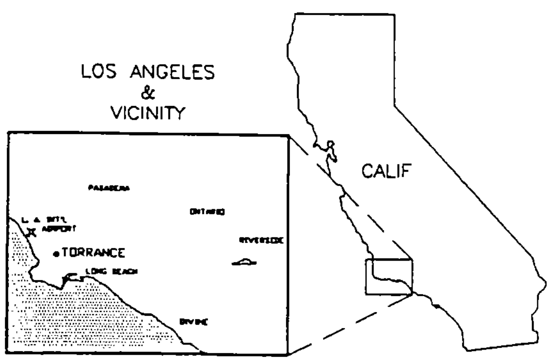
MEASURED GROUNDWATER ELEVATIONS

Well Casing	Casing Elevation (Assumed)	Groundwater Elevation January 16, 1992	Groundwater Elevation June 25, 1992	Change in Elevation
OW-1	100.86	34.86	35.41	-0.55
OW-2	99.63	34.93	35.23	-0.30
OW-3	98.56	34.84	35.24	-0.40
OW-4	99.19	34.73	35.13	-0.40
OW-5	97.99	34.65	35.06	-0.41
OW-6	99.67	34.69	35.07	-0.38

NOTE: Elevation in Feet



SOURCE: USGS 7.5 minute topo sheet, Torrance quad.



N

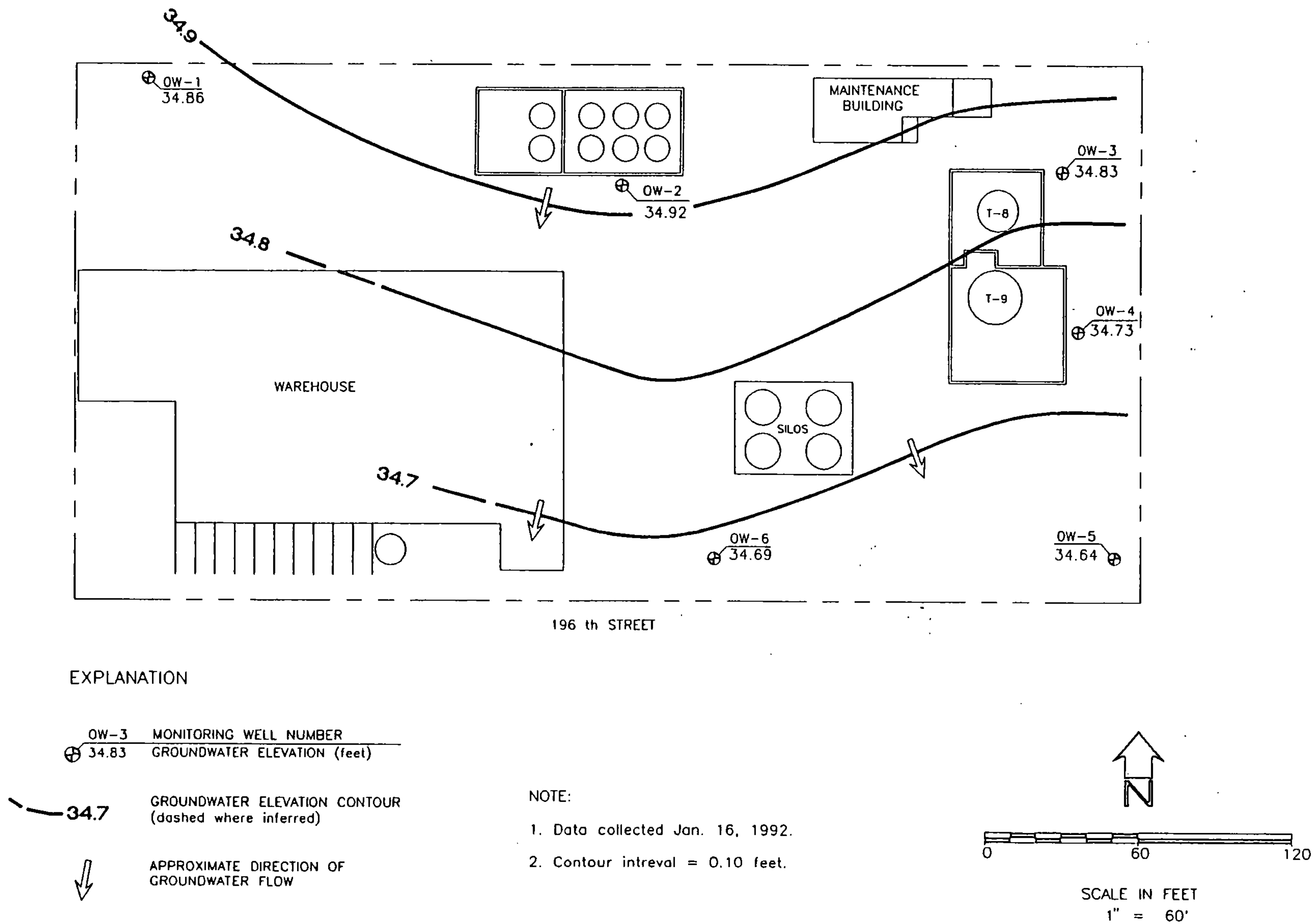
0 2000 4000

SCALE IN FEET

SITE LOCATION MAP
AMOCO CHEMICAL FACILITY
TORRANCE, CALIFORNIA

SIMON HYDRO-SEARCH
5882 BOLSA AVENUE
HUNTINGTON BEACH, CALIFORNIA 92649

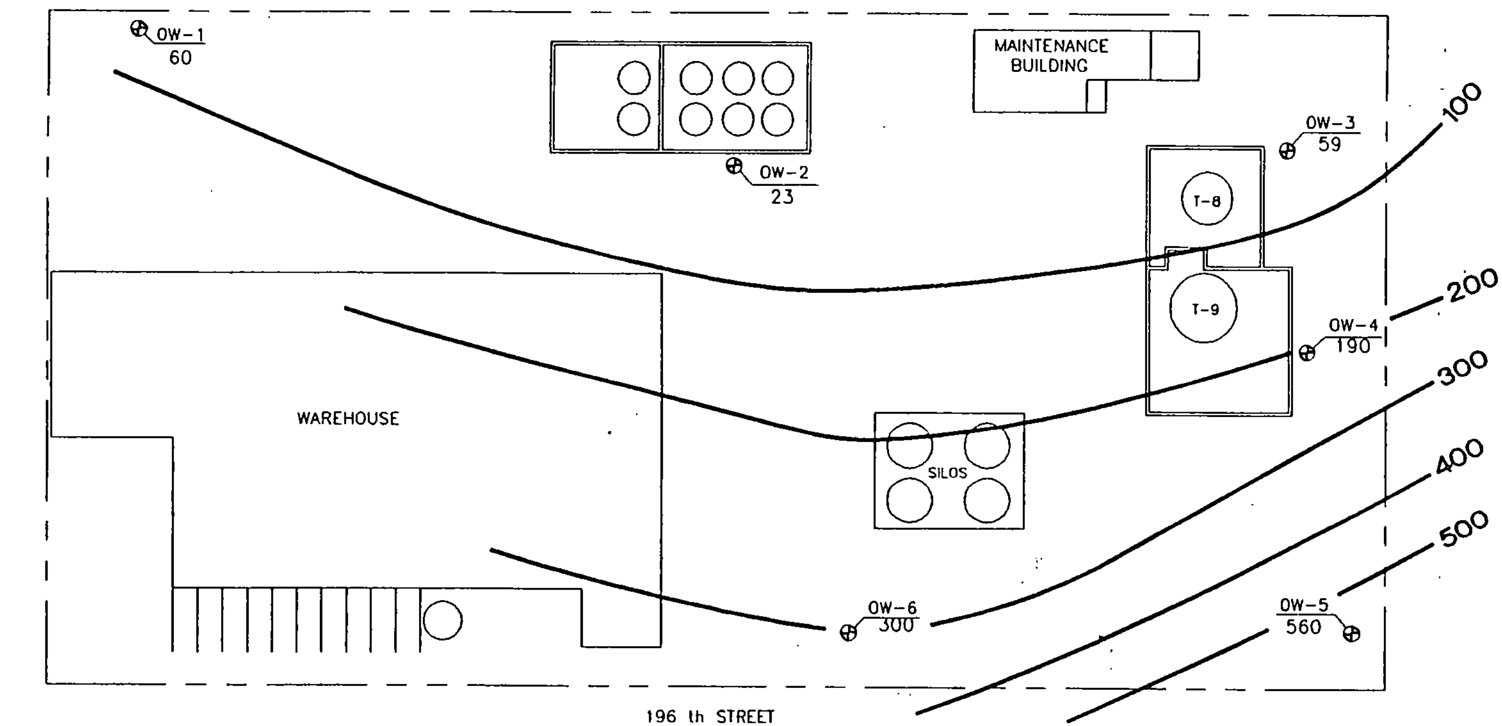
PROJECT NO:	512-345	FIGURE NO:
DATE:	JANUARY, 1992	1



GROUNDWATER ELEVATION CONTOUR MAP
AMOCO CHEMICAL COMPANY
TORRANCE, CALIFORNIA

SIMON HYDRO-SEARCH
5882 BOLSA AVENUE
HUNTINGTON BEACH, CALIFORNIA 92649

PROJECT NO: 512-345	DWG NO: 345001	FIGURE: 2
DATE: JANUARY, 1992	REV. 2/21/92	

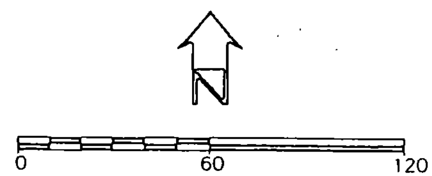


EXPLANATION

OW-3	MONITORING WELL NUMBER
59	CIS-1,2 DICHLOROETHENE CONCENTRATION (ug/L)
500	CIS- 1,2 DICHLOROETHENE CONTOUR (Dashed where inferred)

NOTE: 1. Data collected Jan. 16, 1992

2. Contour Interval = 100(ug/l)

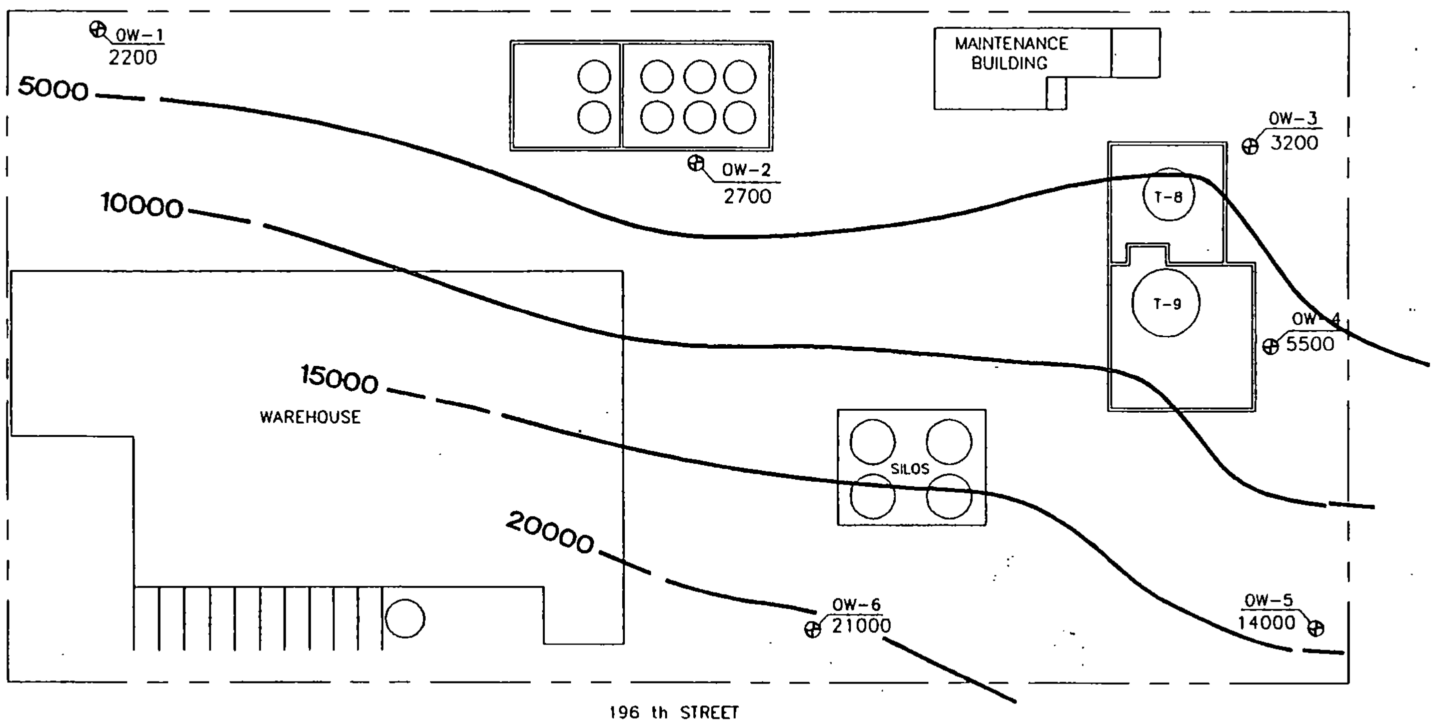


SCALE IN FEET
1" = 60'

CIS – 1,2 DICHLOROETHENE
CONCENTRATION MAP
AMOCO CHEMICAL COMPANY
TORRANCE, CALIFORNIA

SIMON HYDRO-SEARCH
5882 BOLSA AVENUE
HUNTINGTON BEACH, CALIFORNIA 92649

PROJECT NO: 512-345	DWG NO: 345001	FIGURE: 3
DATE: JANUARY, 1992	REV. 2/21/92	



EXPLANATION

OW-3 MONITORING WELL NUMBER
1900 TRICHLOROETHENE CONCENTRATION (ug/L)

5000 TRICHLOROETHENE CONTOUR (Dashed where inferred)

1. Data collected Jan. 16, 1992.
2. Contour Interval = 5000 ug/L.

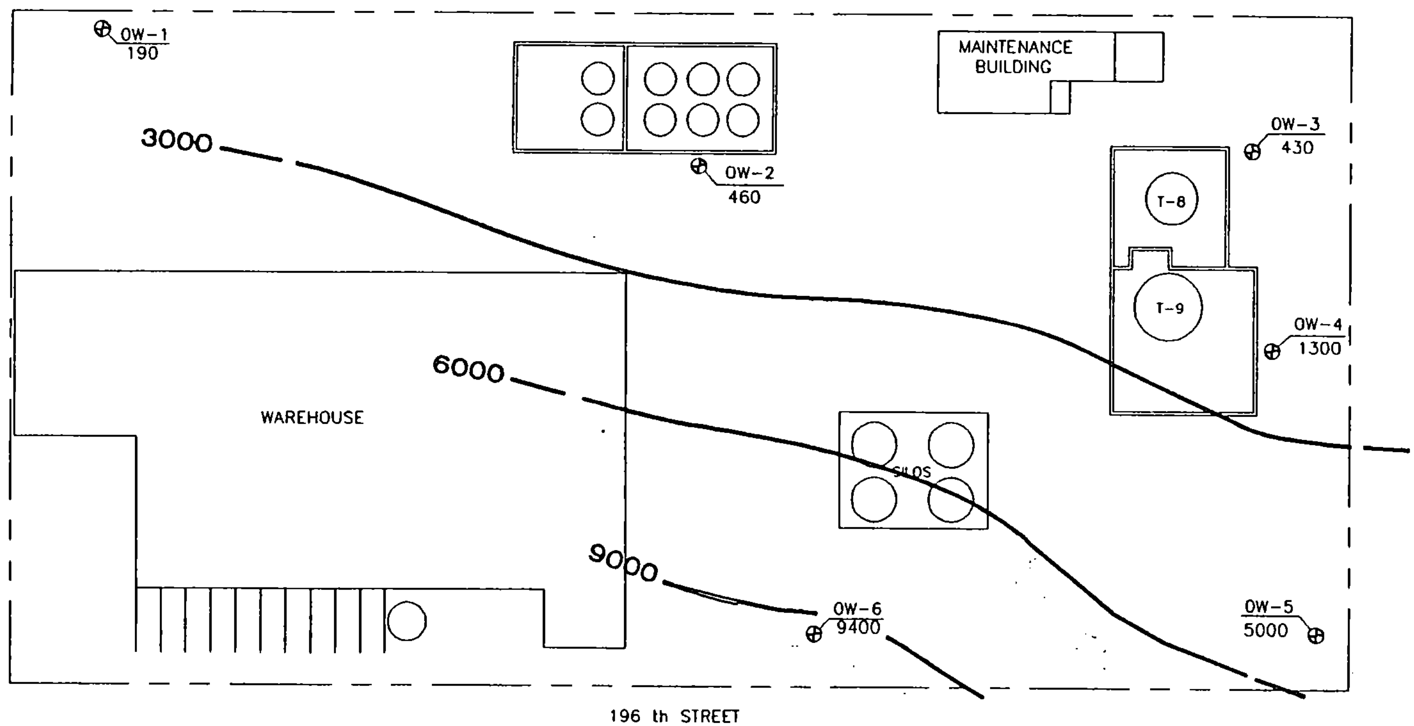
0 60 120

SCALE IN FEET
1" = 60'

TRICHLOROETHENE CONCENTRATION MAP
AMOCO CHEMICAL COMPANY
TORRANCE, CALIFORNIA

SIMON HYDRO-SEARCH
5882 BOLSA AVENUE
HUNTINGTON BEACH, CALIFORNIA 92649

PROJECT NO: 512-345	DWG NO: 345001	FIGURE: 4
DATE: JANUARY, 1992	REV. 2/21/92	



EXPLANATION

OW-3 MONITORING WELL NUMBER
430 TETRACHLOROETHYLENE CONCENTRATION (ug/L)

3000 TETRACHLOROETHYLENE CONTOUR (Dashed where inferred)

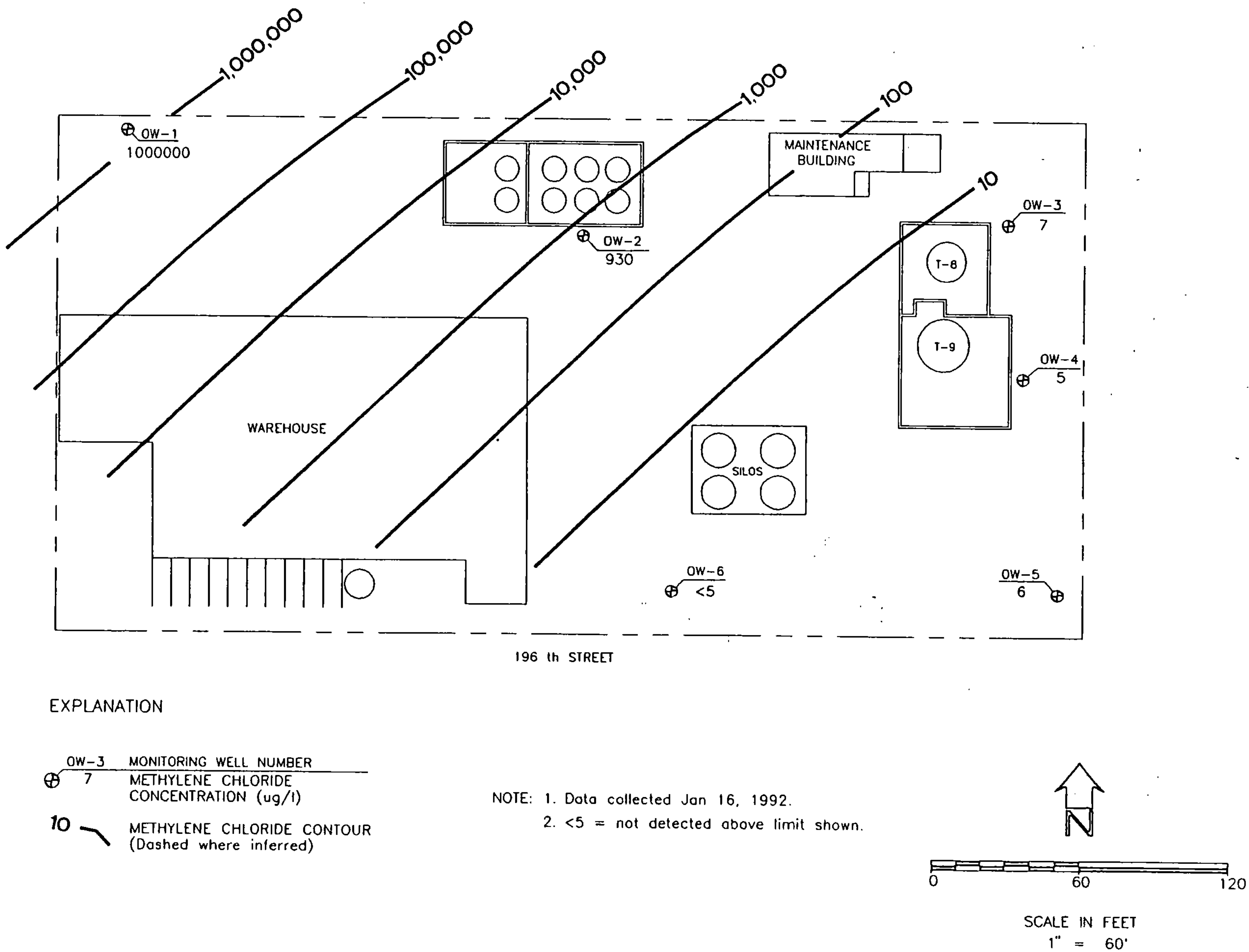
1. Data collected Jan. 16, 1992.
2. Contour interval = 3000 ug/L.

SCALE IN FEET
1" = 60'

TETRACHLOROETHENE CONCENTRATION MAP
AMOCO CHEMICAL COMPANY
TORRANCE, CALIFORNIA

SIMON HYDRO-SEARCH
5882 BOLSA AVENUE
HUNTINGTON BEACH, CALIFORNIA 92649

PROJECT NO: 512-345	DWG NO: 345001	FIGURE: 5
DATE: JANUARY, 1992	REV. 2/21/92	



EXPLANATION

OW-3 MONITORING WELL NUMBER
7 METHYLENE CHLORIDE CONCENTRATION (ug/l)

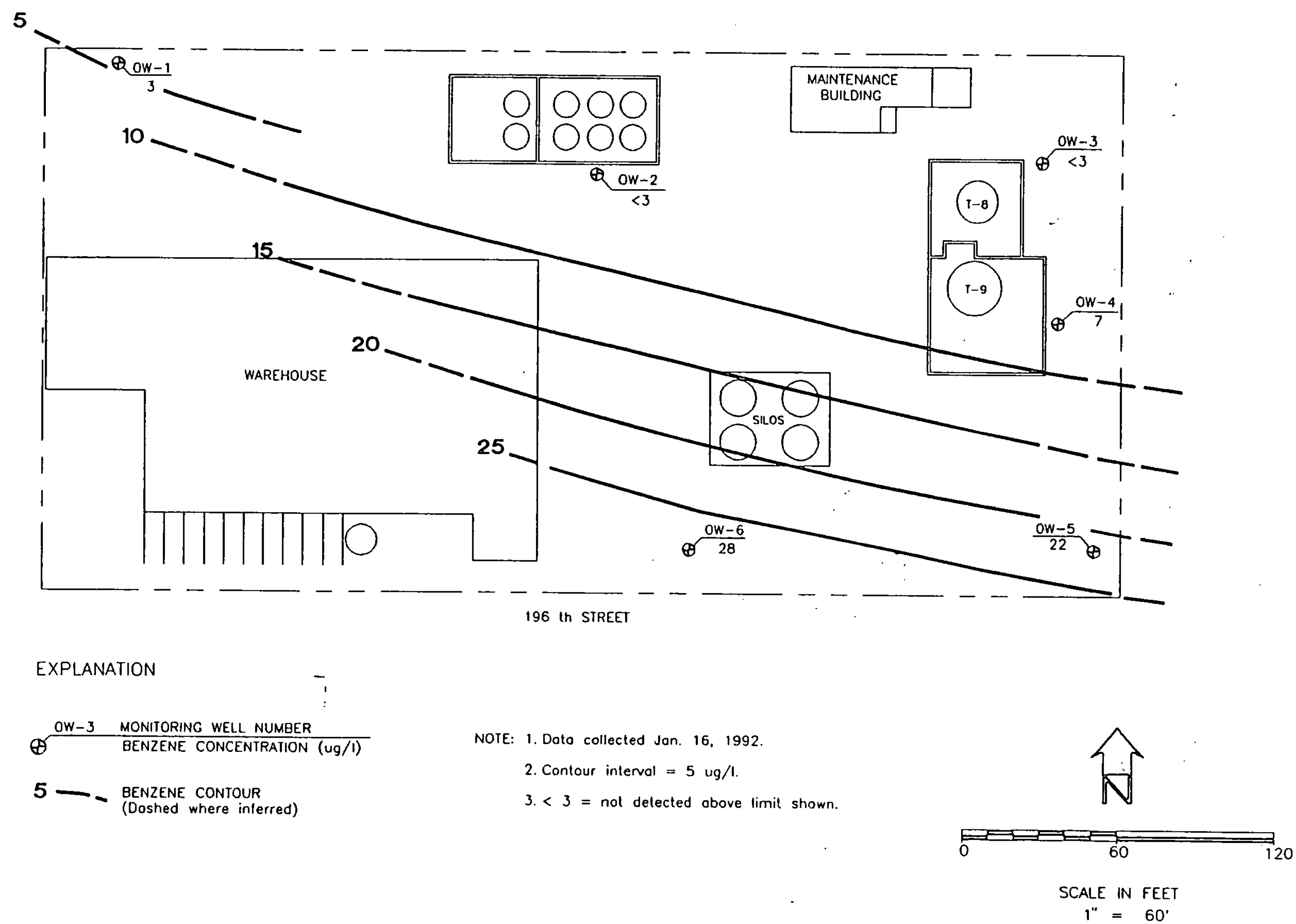
10 METHYLENE CHLORIDE CONTOUR (Dashed where inferred)

NOTE: 1. Data collected Jan 16, 1992.
2. <5 = not detected above limit shown.

METHYLENE CHLORIDE CONCENTRATION MAP
AMOCO CHEMICAL COMPANY
TORRANCE, CALIFORNIA

SIMON HYDRO-SEARCH
5882 BOLSA AVENUE
HUNTINGTON BEACH, CALIFORNIA 92649

PROJECT NO: 512-345	DWG NO: 345001	FIGURE: 6
DATE: JANUARY, 1992	REV. 2/21/92	



BENZENE CONCENTRATION MAP
AMOCO CHEMICAL COMPANY
TORRANCE, CALIFORNIA

SIMON HYDRO-SEARCH
5882 BOLSA AVENUE
HUNTINGTON BEACH, CALIFORNIA 92649

PROJECT NO: 512-345	DWG NO: 345001	FIGURE: 7
DATE: JANUARY, 1992	REV. 2/21/92	

APPENDIX A

LABORATORY REPORTS AND CHAIN-OF-CUSTODY FORMS

THE EARTH TECHNOLOGY CORP.
ANALYTICAL LABORATORIES
5702 BOLSA AVENUE
HUNTINGTON BEACH, CA 92649
Attn: Harvey Pierre
Phone: (714) 892-2565

Simon Environmental Eng.
5882 Bolsa Ave.
Huntington Beach, Ca. 92649

Attn: Leo Chaidez
Invoice Number:

Order #: 92-01-040
Date: 01/21/92 08:32
Work ID: TORRANCE/512-345
Date Received: 01/16/92
Date Completed: 01/21/92

SAMPLE IDENTIFICATION

Sample Number	Sample Description	Sample Number	Sample Description
01	OW-01-01	02	OW-01-02
03	OW-02-03	04	OW-02-04
05	OW-100-05	06	OW-100-06
07	OW-03-07	08	OW-03-08
09	OW-04-09	10	OW-04-10
11	OW-05-11	12	OW-05-12
13	OW-06-13	14	OW-06-14
15	OW-00-15	16	OW-00-16

MULTIPLY THE DETECTION LIMIT BY THE DILUTION FACTOR.
ND = Indicates analyte not detected.
B = Indicates the analyte was observed in associated blank as well as the sample.

Approval: Harvey Pierre
Harvey Pierre
Laboratory Manager

1/21/92
Date

Received: 01/16/92

ETAL REPORT

Results by Sample

Work Order # 92-01-040

SAMPLE ID GW-01-01 FRACTION 01A TEST CODE 624 NAME Volatiles in water

Date & Time Collected 01/16/92 Category

PARAMETER	RESULT	LIMIT	D_F	DATE_ANAL
Dichlorodifluoromethane	ND	20	1.0	01/17/92
Chloromethane	ND	10	1.0	01/17/92
Vinyl Chloride	ND	10	1.0	01/17/92
Bromomethane	ND	10	1.0	01/17/92
Chloroethane	ND	10	1.0	01/17/92
Trichlorofluoromethane	ND	10	1.0	01/17/92
Ethanol	ND	20	1.0	01/17/92
1,1-Dichloroethene	8.0	3.0	1.0	01/17/92
Acrolein	ND	10	1.0	01/17/92
Acetone	ND	20	1.0	01/17/92
Iodomethane	ND	10	1.0	01/17/92
Carbon Disulfide	ND	5.0	1.0	01/17/92
Methylene chloride	1000000	5.0	10000	01/18/92
Trans-1,2-Dichloroethene	ND	3.0	1.0	01/17/92
Acrylonitrile	ND	10	1.0	01/17/92
1,1-Dichloroethane	ND	3.0	1.0	01/17/92
2-Butanone	ND	20	1.0	01/17/92
cis-1,2-Dichloroethene	60	3.0	1.0	01/17/92
Chloroform	37	3.0	1.0	01/17/92
1,2-Dichloroethane	ND	3.0	1.0	01/17/92
Vinyl Acetate	ND	20	1.0	01/17/92
1,1,1-Trichloroethane	ND	3.0	1.0	01/17/92
Carbon Tetrachloride	ND	3.0	1.0	01/17/92
Benzene	3.0	3.0	1.0	01/17/92
Trichloroethene	2200	3.0	100	01/17/92
1,2-Dichloropropane	ND	5.0	1.0	01/17/92
Bromodichloromethane	ND	3.0	1.0	01/17/92
Dibromomethane	ND	10	1.0	01/17/92
2-Chloroethyl vinyl ether	ND	10	1.0	01/17/92
cis-1,3-Dichloropropene	ND	3.0	1.0	01/17/92
trans-1,3-Dichloropropene	ND	5.0	1.0	01/17/92
Ethyl methacrylate	ND	10	1.0	01/17/92
1,1,2-Trichloroethane	6.0	5.0	1.0	01/17/92
Dibromochloromethane	ND	3.0	1.0	01/17/92
Bromoform	ND	5.0	1.0	01/17/92
4-Methyl-2-Pentanone	ND	20	1.0	01/17/92
Toluene	4.0	3.0	1.0	01/17/92
2-Hexanone	ND	20	1.0	01/17/92
1,1,2,2-Tetrachloroethane	ND	3.0	1.0	01/17/92
Tetrachloroethene	190	3.0	1.0	01/17/92
Chlorobenzene	ND	3.0	1.0	01/17/92
Ethylbenzene	5.0	3.0	1.0	01/17/92
Xylene(total)	14	3.0	1.0	01/17/92
Styrene	ND	3.0	1.0	01/17/92
cis-1,4-Dichloro-2-Butene	ND	10	1.0	01/17/92
1,2,3-Trichloropropane	ND	10	1.0	01/17/92
trans-1,4-Dichloro-2-Butene	ND	10	1.0	01/17/92

Notes and Definitions for this Report:

SAMPLE ID GW-01-01 FRACTION 01A TEST CODE 624 NAME Volatiles in water
Date & Time Collected 01/16/92 Category

ANALYST CL
FILE ID *
UNITS ug/L
BATCH_ID VOA1-92-010
COMMENTS * = >1V947; >1V956; >1V965

Received: 01/16/92

Results by Sample

MPLE ID OW-01-02 FRACTION 02A TEST CODE 625 NAME Semi-Volatiles in water
Date & Time Collected 01/16/92 Category

PARAMETER	RESULT	LIMIT	D_F	DATE_ANAL
N-Nitrosodimethylamine	ND	10	1.0	01/18/92
2-Picoline	ND	50	1.0	01/18/92
Methyl_methanesulfonate	ND	50	1.0	01/18/92
Ethyl methanesulfonate	ND	50	1.0	01/18/92
Phenol	ND	10	1.0	01/18/92
Aniline	ND	10	1.0	01/18/92
bis(2-chloroethyl) ether	ND	5.0	1.0	01/18/92
2-Chlorophenol	ND	10	1.0	01/18/92
1,3-Dichlorobenzene	ND	5.0	1.0	01/18/92
1,4-Dichlorobenzene	ND	5.0	1.0	01/18/92
Benzyl alcohol	ND	10	1.0	01/18/92
1,2-Dichlorobenzene	ND	5.0	1.0	01/18/92
2-Methylphenol	ND	10	1.0	01/18/92
bis(2chloroisopropyl)ether	ND	5.0	1.0	01/18/92
Acetophenone	ND	50	1.0	01/18/92
4-Methylphenol	ND	10	1.0	01/18/92
N-Nitroso-di-n-propylamine	ND	5.0	1.0	01/18/92
Hexachloroethane	ND	5.0	1.0	01/18/92
Nitrobenzene	ND	5.0	1.0	01/18/92
N-Nitrosopiperidine	ND	50	1.0	01/18/92
Isophorone	ND	5.0	1.0	01/18/92
2-Nitrophenol	ND	10	1.0	01/18/92
2,4-Dimethylphenol	ND	10	1.0	01/18/92
Benzoic acid	ND	50	1.0	01/18/92
bis(2-Chloroethoxy)methane	ND	10	1.0	01/18/92
a,a-Dimethylphenethylamine	ND	50	1.0	01/18/92
2,4-Dichlorophenol	ND	10	1.0	01/18/92
1,2,4-Trichlorobenzene	ND	5.0	1.0	01/18/92
Naphthalene	ND	5.0	1.0	01/18/92
2,6-Dichlorophenol	ND	50	1.0	01/18/92
4-Chloroaniline	ND	20	1.0	01/18/92
Hexachlorobutadiene	ND	5.0	1.0	01/18/92
N-Nitroso-di-n-butylamine	ND	50	1.0	01/18/92
4-Chloro-3-methylphenol	ND	10	1.0	01/18/92
2-Methylnaphthalene	ND	5.0	1.0	01/18/92
1,2,4,5-Tetrachlorobenzene	ND	50	1.0	01/18/92
Hexachlorocyclopentadiene	ND	5.0	1.0	01/18/92
2,4,6-Trichlorophenol	ND	10	1.0	01/18/92
2,4,5-Trichlorophenol	ND	10	1.0	01/18/92
2-Chloronaphthalene	ND	5.0	1.0	01/18/92
1-Chloronaphthalene	ND	50	1.0	01/18/92
2-Nitroaniline	ND	50	1.0	01/18/92
Dimethyl phthalate	ND	5.0	1.0	01/18/92
Acenaphthylene	ND	5.0	1.0	01/18/92
2,6-Dinitrotoluene	ND	5.0	1.0	01/18/92
3-Nitroaniline	ND	50	1.0	01/18/92
Acenaphthene	ND	5.0	1.0	01/18/92
2,4-Dinitrophenol	ND	50	1.0	01/18/92
4-Nitrophenol	ND	50	1.0	01/18/92
Dibenzofuran	ND	5.0	1.0	01/18/92

MPLE ID GW-01-02 FRACTION 02A TEST CODE 625 NAME Semi-Volatiles in water
Date & Time Collected 01/16/92 Category

Pentachlorobenzene	ND	50	1.0	01/18/92
2,4-Dinitrotoluene	ND	5.0	1.0	01/18/92
1-Naphthylamine	ND	50	1.0	01/18/92
2-Naphthylamine	ND	50	1.0	01/18/92
2,3,4,6-Tetrachlorophenol	ND	50	1.0	01/18/92
Diethylphthalate	ND	5.0	1.0	01/18/92
4-Chlorophenyl-phenylether	ND	5.0	1.0	01/18/92
Fluorene	ND	5.0	1.0	01/18/92
4-Nitroaniline	ND	50	1.0	01/18/92
4,6-Dinitro-2-methylphenol	ND	50	1.0	01/18/92
Diphenylamine	ND	50	1.0	01/18/92
N-Nitrosodiphenylamine	ND	10	1.0	01/18/92
Azobenzene	ND	5.0	1.0	01/18/92
4-Bromophenyl-phenylether	ND	5.0	1.0	01/18/92
Phenacetin	ND	50	1.0	01/18/92
Hexachlorobenzene	ND	5.0	1.0	01/18/92
4-Aminobiphenyl	ND	50	1.0	01/18/92
Pentachlorophenol	ND	30	1.0	01/18/92
Pronamide	ND	50	1.0	01/18/92
Phenanthrene	ND	5.0	1.0	01/18/92
Anthracene	ND	5.0	1.0	01/18/92
Di-n-butylphthalate	ND	5.0	1.0	01/18/92
Fluoranthene	ND	5.0	1.0	01/18/92
Benzidine	ND	50	1.0	01/18/92
Pyrene	ND	5.0	1.0	01/18/92
p-Dimethylaminoazobenzene	ND	50	1.0	01/18/92
Butylbenzylphthalate	ND	5.0	1.0	01/18/92
3,3'-Dichlorobenzidine	ND	20	1.0	01/18/92
Benzo(a)anthracene	ND	5.0	1.0	01/18/92
Chrysene	ND	5.0	1.0	01/18/92
bis(2-Ethylhexyl)phthalate	ND	5.0	1.0	01/18/92
Di-n-octyl phthalate	ND	5.0	1.0	01/18/92
7,12-Dimethylbenz(a)anthrace	ND	50	1.0	01/18/92
Benzo(b)fluoranthene	ND	5.0	1.0	01/18/92
Benzo(k)fluoranthene	ND	5.0	1.0	01/18/92
Benzo(a)pyrene	ND	5.0	1.0	01/18/92
3-Methylcholanthrene	ND	50	1.0	01/18/92
Dibenz(a,j)acridine	ND	50	1.0	01/18/92
Indeno(1,2,3-cd)pyrene	ND	5.0	1.0	01/18/92
Dibenzo(a,h)anthracene	ND	5.0	1.0	01/18/92
Benzo(g,h,i)perylene	ND	5.0	1.0	01/18/92

Notes and Definitions for this Report:

EXTRACTED 01/17/92
ANALYST TT
FILE ID >AE755
UNITS ug/L
BATCH_ID 625-76
COMMENTS

Received: 01/16/92
Results by Sample

AMPLE ID CW-02-03 FRACTION 03A TEST CODE 624 NAME Volatiles in water
Date & Time Collected 01/16/92 Category

PARAMETER	RESULT	LIMIT	D_F	DATE_ANAL
Dichlorodifluoromethane	ND	20	1.0	01/17/92
Chloromethane	ND	10	1.0	01/17/92
Vinyl Chloride	ND	10	1.0	01/17/92
Bromomethane	ND	10	1.0	01/17/92
Chloroethane	ND	10	1.0	01/17/92
Trichlorofluoromethane	17	10	1.0	01/17/92
Ethanol	ND	20	1.0	01/17/92
1,1-Dichloroethene	ND	3.0	1.0	01/17/92
Acrolein	ND	10	1.0	01/17/92
Acetone	ND	20	1.0	01/17/92
Iodomethane	ND	10	1.0	01/17/92
Carbon Disulfide	ND	5.0	1.0	01/17/92
Methylene chloride	930	5.0	100	01/17/92
Trans-1,2-Dichloroethene	7.0	3.0	1.0	01/17/92
Acrylonitrile	ND	10	1.0	01/17/92
1,1-Dichloroethane	ND	3.0	1.0	01/17/92
2-Butanone	ND	20	1.0	01/17/92
cis-1,2-Dichloroethene	23	3.0	1.0	01/17/92
Chloroform	11	3.0	1.0	01/17/92
1,2-Dichloroethane	ND	3.0	1.0	01/17/92
Vinyl Acetate	ND	20	1.0	01/17/92
1,1,1-Trichloroethane	ND	3.0	1.0	01/17/92
Carbon Tetrachloride	ND	3.0	1.0	01/17/92
Benzene	ND	3.0	1.0	01/17/92
Trichloroethene	2700	3.0	100	01/17/92
1,2-Dichloropropane	ND	5.0	1.0	01/17/92
Bromodichloromethane	ND	3.0	1.0	01/17/92
Dibromomethane	ND	10	1.0	01/17/92
2-Chloroethyl vinyl ether	ND	10	1.0	01/17/92
cis-1,3-Dichloropropene	ND	3.0	1.0	01/17/92
trans-1,3-Dichloropropene	ND	5.0	1.0	01/17/92
Ethyl methacrylate	ND	10	1.0	01/17/92
1,1,2-Trichloroethane	ND	5.0	1.0	01/17/92
Dibromochloromethane	ND	3.0	1.0	01/17/92
Bromoform	ND	5.0	1.0	01/17/92
4-Methyl-2-Pentanone	ND	20	1.0	01/17/92
Toluene	ND	3.0	1.0	01/17/92
2-Hexanone	ND	20	1.0	01/17/92
1,1,2,2-Tetrachloroethane	ND	3.0	1.0	01/17/92
Tetrachloroethene	460	3.0	100	01/17/92
Chlorobenzene	ND	3.0	1.0	01/17/92
Ethylbenzene	ND	3.0	1.0	01/17/92
Xylene(total)	ND	3.0	1.0	01/17/92
Styrene	ND	3.0	1.0	01/17/92
cis-1,4-Dichloro-2-Butene	ND	10	1.0	01/17/92
1,2,3-Trichloropropane	ND	10	1.0	01/17/92
trans-1,4-Dichloro-2-Butene	ND	10	1.0	01/17/92

Notes and Definitions for this Report:

SAMPLE ID OW-02-03 FRACTION 03A TEST CODE 624 NAME Volatiles in water
Date & Time Collected 01/16/92 Category

ANALYST CL
FILE ID >1V948; >1V957
UNITS ug/L
BATCH_ID VOA1-92-010
COMMENTS

Received: 01/16/92

Results by Sample

AMPLE ID OW-02-04 FRACTION 04A TEST CODE 625 NAME Semi-Volatiles in water

Date & Time Collected 01/16/92 Category

PARAMETER	RESULT	LIMIT	D_F	DATE_ANAL
N-Nitrosodimethylamine	ND	10	1.0	01/18/92
2-Picoline	ND	50	1.0	01/18/92
Methyl_methanesulfonate	ND	50	1.0	01/18/92
Ethyl methanesulfonate	ND	50	1.0	01/18/92
Phenol	ND	10	1.0	01/18/92
Aniline	ND	10	1.0	01/18/92
bis(2-chloroethyl) ether	ND	5.0	1.0	01/18/92
2-Chlorophenol	ND	10	1.0	01/18/92
1,3-Dichlorobenzene	ND	5.0	1.0	01/18/92
1,4-Dichlorobenzene	ND	5.0	1.0	01/18/92
Benzyl alcohol	ND	10	1.0	01/18/92
1,2-Dichlorobenzene	ND	5.0	1.0	01/18/92
2-Methylphenol	ND	10	1.0	01/18/92
bis(2chloroisopropyl)ether	ND	5.0	1.0	01/18/92
Acetophenone	ND	50	1.0	01/18/92
4-Methylphenol	ND	10	1.0	01/18/92
N-Nitroso-di-n-propylamine	ND	5.0	1.0	01/18/92
Hexachloroethane	ND	5.0	1.0	01/18/92
Nitrobenzene	ND	5.0	1.0	01/18/92
N-Nitrosopiperidine	ND	50	1.0	01/18/92
Isophorone	ND	5.0	1.0	01/18/92
2-Nitrophenol	ND	10	1.0	01/18/92
2,4-Dimethylphenol	ND	10	1.0	01/18/92
Benzoic acid	ND	50	1.0	01/18/92
bis(2-Chloroethoxy)methane	ND	10	1.0	01/18/92
a,a-Dimethylphenethylamine	ND	50	1.0	01/18/92
2,4-Dichlorophenol	ND	10	1.0	01/18/92
1,2,4-Trichlorobenzene	ND	5.0	1.0	01/18/92
Naphthalene	ND	5.0	1.0	01/18/92
2,6-Dichlorophenol	ND	50	1.0	01/18/92
4-Chloroaniline	ND	20	1.0	01/18/92
Hexachlorobutadiene	ND	5.0	1.0	01/18/92
N-Nitroso-di-n-butylamine	ND	50	1.0	01/18/92
4-Chloro-3-methylphenol	ND	10	1.0	01/18/92
2-Methylnaphthalene	ND	5.0	1.0	01/18/92
1,2,4,5-Tetrachlorobenzene	ND	50	1.0	01/18/92
Hexachlorocyclopentadiene	ND	5.0	1.0	01/18/92
2,4,6-Trichlorophenol	ND	10	1.0	01/18/92
2,4,5-Trichlorophenol	ND	10	1.0	01/18/92
2-Chloronaphthalene	ND	5.0	1.0	01/18/92
1-Chloronaphthalene	ND	50	1.0	01/18/92
2-Nitroaniline	ND	50	1.0	01/18/92
Dimethyl phthalate	ND	5.0	1.0	01/18/92
Acenaphthylene	ND	5.0	1.0	01/18/92
2,6-Dinitrotoluene	ND	5.0	1.0	01/18/92
3-Nitroaniline	ND	50	1.0	01/18/92
Acenaphthene	ND	5.0	1.0	01/18/92
2,4-Dinitrophenol	ND	50	1.0	01/18/92
4-Nitrophenol	ND	50	1.0	01/18/92
Dibenzofuran	ND	5.0	1.0	01/18/92

AMPLE ID CW-02-04 FRACTION 04A TEST CODE 625 NAME Semi-Volatiles in water
Date & Time Collected 01/16/92 Category

Pentachlorobenzene	ND	50	1.0	01/18/92
2,4-Dinitrotoluene	ND	5.0	1.0	01/18/92
1-Naphthylamine	ND	50	1.0	01/18/92
2-Naphthylamine	ND	50	1.0	01/18/92
2,3,4,6-Tetrachlorophenol	ND	50	1.0	01/18/92
Diethylphthalate	ND	5.0	1.0	01/18/92
4-Chlorophenyl-phenylether	ND	5.0	1.0	01/18/92
Fluorene	ND	5.0	1.0	01/18/92
4-Nitroaniline	ND	50	1.0	01/18/92
4,6-Dinitro-2-methylphenol	ND	50	1.0	01/18/92
Diphenylamine	ND	50	1.0	01/18/92
N-Nitrosodiphenylamine	ND	10	1.0	01/18/92
Azobenzene	ND	5.0	1.0	01/18/92
4-Bromophenyl-phenylether	ND	5.0	1.0	01/18/92
Phenacetin	ND	50	1.0	01/18/92
Hexachlorobenzene	ND	5.0	1.0	01/18/92
4-Aminobiphenyl	ND	50	1.0	01/18/92
Pentachlorophenol	ND	30	1.0	01/18/92
Pronamide	ND	50	1.0	01/18/92
Phenanthrene	ND	5.0	1.0	01/18/92
Anthracene	ND	5.0	1.0	01/18/92
Di-n-butylphthalate	ND	5.0	1.0	01/18/92
Fluoranthene	ND	5.0	1.0	01/18/92
Benzidine	ND	50	1.0	01/18/92
Pyrene	ND	5.0	1.0	01/18/92
p-Dimethylaminoazobenzene	ND	50	1.0	01/18/92
Butylbenzylphthalate	ND	5.0	1.0	01/18/92
3,3'-Dichlorobenzidine	ND	20	1.0	01/18/92
Benzo(a)anthracene	ND	5.0	1.0	01/18/92
Chrysene	ND	5.0	1.0	01/18/92
bis(2-Ethylhexyl)phthalate	ND	5.0	1.0	01/18/92
Di-n-octyl phthalate	ND	5.0	1.0	01/18/92
7,12-Dimethylbenz(a)anthrace	ND	50	1.0	01/18/92
Benzo(b)fluoranthene	ND	5.0	1.0	01/18/92
Benzo(k)fluoranthene	ND	5.0	1.0	01/18/92
Benzo(a)pyrene	ND	5.0	1.0	01/18/92
3-Methylcholanthrene	ND	50	1.0	01/18/92
Dibenz(a,j)acridine	ND	50	1.0	01/18/92
Indeno(1,2,3-cd)pyrene	ND	5.0	1.0	01/18/92
Dibenzo(a,h)anthracene	ND	5.0	1.0	01/18/92
Benzo(g,h,i)perylene	ND	5.0	1.0	01/18/92

Notes and Definitions for this Report:

EXTRACTED 01/17/92
ANALYST TT
FILE ID >AE749
UNITS ug/L
BATCH_ID 625-76
COMMENTS

Received: 01/16/92

Results by Sample

AMPLE ID GW-100-05 FRACTION 05A TEST CODE 624 NAME Volatiles in water

Date & Time Collected 01/16/92 Category

PARAMETER	RESULT	LIMIT	D_F	DATE_ANAL
Dichlorodifluoromethane	ND	20	1.0	01/17/92
Chloromethane	ND	10	1.0	01/17/92
Vinyl Chloride	ND	10	1.0	01/17/92
Bromomethane	ND	10	1.0	01/17/92
Chloroethane	ND	10	1.0	01/17/92
Trichlorofluoromethane	18	10	1.0	01/17/92
Ethanol	ND	20	1.0	01/17/92
1,1-Dichloroethene	ND	3.0	1.0	01/17/92
Acrolein	ND	10	1.0	01/17/92
Acetone	ND	20	1.0	01/17/92
Iodomethane	ND	10	1.0	01/17/92
Carbon Disulfide	ND	5.0	1.0	01/17/92
Methylene chloride	25	5.0	1.0	01/17/92
Trans-1,2-Dichloroethene	8.0	3.0	1.0	01/17/92
Acrylonitrile	ND	10	1.0	01/17/92
1,1-Dichloroethane	ND	3.0	1.0	01/17/92
2-Butanone	ND	20	1.0	01/17/92
cis-1,2-Dichloroethene	24	3.0	1.0	01/17/92
Chloroform	13	3.0	1.0	01/17/92
1,2-Dichloroethane	ND	3.0	1.0	01/17/92
Vinyl Acetate	ND	20	1.0	01/17/92
1,1,1-Trichloroethane	ND	3.0	1.0	01/17/92
Carbon Tetrachloride	ND	3.0	1.0	01/17/92
Benzene	ND	3.0	1.0	01/17/92
Trichloroethene	2700	3.0	100	01/17/92
1,2-Dichloropropane	ND	5.0	1.0	01/17/92
Bromodichloromethane	ND	3.0	1.0	01/17/92
Dibromomethane	ND	10	1.0	01/17/92
2-Chloroethyl vinyl ether	ND	10	1.0	01/17/92
cis-1,3-Dichloropropene	ND	3.0	1.0	01/17/92
trans-1,3-Dichloropropene	ND	5.0	1.0	01/17/92
Ethyl methacrylate	ND	10	1.0	01/17/92
1,1,2-Trichloroethane	ND	5.0	1.0	01/17/92
Dibromochloromethane	ND	3.0	1.0	01/17/92
Bromoform	ND	5.0	1.0	01/17/92
4-Methyl-2-Pentanone	ND	20	1.0	01/17/92
Toluene	ND	3.0	1.0	01/17/92
2-Hexanone	ND	20	1.0	01/17/92
1,1,2,2-Tetrachloroethane	ND	3.0	1.0	01/17/92
Tetrachloroethene	390	3.0	100	01/17/92
Chlorobenzene	ND	3.0	1.0	01/17/92
Ethylbenzene	ND	3.0	1.0	01/17/92
Xylene(total)	ND	3.0	1.0	01/17/92
Styrene	ND	3.0	1.0	01/17/92
cis-1,4-Dichloro-2-Butene	ND	10	1.0	01/17/92
1,2,3-Trichloropropane	ND	10	1.0	01/17/92
trans-1,4-Dichloro-2-Butene	ND	10	1.0	01/17/92

Notes and Definitions for this Report:

Received: 01/16/92

ETAL REPORT
Results by Sample

Work Order # 92-01-040
Continued From Above

MPLE ID CW-100-05 FRACTION 05A TEST CODE 624 NAME Volatiles in water
Date & Time Collected 01/16/92 Category

ANALYST CL
FILE ID >1V949; >1V958
UNITS ug/L
BATCH_ID VOA1-92-010
COMMENTS

Received: 01/16/92 Results by Sample

SAMPLE ID CW-100-06 FRACTION 06A TEST CODE 625 NAME Semi-Volatiles in water
Date & Time Collected 01/16/92 Category

PARAMETER	RESULT	LIMIT	D_F	DATE_ANAL
N-Nitrosodimethylamine	ND	10	1.0	01/18/92
2-Picoline	ND	50	1.0	01/18/92
Methyl_methanesulfonate	ND	50	1.0	01/18/92
Ethyl methanesulfonate	ND	50	1.0	01/18/92
Phenol	ND	10	1.0	01/18/92
Aniline	ND	10	1.0	01/18/92
bis(2-chloroethyl) ether	ND	5.0	1.0	01/18/92
2-Chlorophenol	ND	10	1.0	01/18/92
1,3-Dichlorobenzene	ND	5.0	1.0	01/18/92
1,4-Dichlorobenzene	ND	5.0	1.0	01/18/92
Benzyl alcohol	ND	10	1.0	01/18/92
1,2-Dichlorobenzene	ND	5.0	1.0	01/18/92
2-Methylphenol	ND	10	1.0	01/18/92
bis(2chloroisopropyl)ether	ND	5.0	1.0	01/18/92
Acetophenone	ND	50	1.0	01/18/92
4-Methylphenol	ND	10	1.0	01/18/92
N-Nitroso-di-n-propylamine	ND	5.0	1.0	01/18/92
Hexachloroethane	ND	5.0	1.0	01/18/92
Nitrobenzene	ND	5.0	1.0	01/18/92
N-Nitrosopiperidine	ND	50	1.0	01/18/92
Isophorone	ND	5.0	1.0	01/18/92
2-Nitrophenol	ND	10	1.0	01/18/92
2,4-Dimethylphenol	ND	10	1.0	01/18/92
Benzoic acid	ND	50	1.0	01/18/92
bis(2-Chloroethoxy)methane	ND	10	1.0	01/18/92
a,a-Dimethylphenethylamine	ND	50	1.0	01/18/92
2,4-Dichlorophenol	ND	10	1.0	01/18/92
1,2,4-Trichlorobenzene	ND	5.0	1.0	01/18/92
Naphthalene	ND	5.0	1.0	01/18/92
2,6-Dichlorophenol	ND	50	1.0	01/18/92
4-Chloroaniline	ND	20	1.0	01/18/92
Hexachlorobutadiene	ND	5.0	1.0	01/18/92
N-Nitroso-di-n-butylamine	ND	50	1.0	01/18/92
4-Chloro-3-methylphenol	ND	10	1.0	01/18/92
2-Methylnaphthalene	ND	5.0	1.0	01/18/92
1,2,4,5-Tetrachlorobenzene	ND	50	1.0	01/18/92
Hexachlorocyclopentadiene	ND	5.0	1.0	01/18/92
2,4,6-Trichlorophenol	ND	10	1.0	01/18/92
2,4,5-Trichlorophenol	ND	10	1.0	01/18/92
2-Chloronaphthalene	ND	5.0	1.0	01/18/92
1-Chloronaphthalene	ND	50	1.0	01/18/92
2-Nitroaniline	ND	50	1.0	01/18/92
Dimethyl phthalate	ND	5.0	1.0	01/18/92
Acenaphthylene	ND	5.0	1.0	01/18/92
2,6-Dinitrotoluene	ND	5.0	1.0	01/18/92
3-Nitroaniline	ND	50	1.0	01/18/92
Acenaphthene	ND	5.0	1.0	01/18/92
2,4-Dinitrophenol	ND	50	1.0	01/18/92
4-Nitrophenol	ND	50	1.0	01/18/92
Dibenzofuran	ND	5.0	1.0	01/18/92

SAMPLE ID OW-100-06 FRACTION 06A TEST CODE 625 NAME Semi-Volatiles in water
Date & Time Collected 01/16/92 Category

Pentachlorobenzene	ND	50	1.0	01/18/92
2,4-Dinitrotoluene	ND	5.0	1.0	01/18/92
1-Naphthylamine	ND	50	1.0	01/18/92
2-Naphthylamine	ND	50	1.0	01/18/92
2,3,4,6-Tetrachlorophenol	ND	50	1.0	01/18/92
Diethylphthalate	ND	5.0	1.0	01/18/92
4-Chlorophenyl-phenylether	ND	5.0	1.0	01/18/92
Fluorene	ND	5.0	1.0	01/18/92
4-Nitroaniline	ND	50	1.0	01/18/92
4,6-Dinitro-2-methylphenol	ND	50	1.0	01/18/92
Diphenylamine	ND	50	1.0	01/18/92
N-Nitrosodiphenylamine	ND	10	1.0	01/18/92
Azobenzene	ND	5.0	1.0	01/18/92
4-Bromophenyl-phenylether	ND	5.0	1.0	01/18/92
Phenacetin	ND	50	1.0	01/18/92
Hexachlorobenzene	ND	5.0	1.0	01/18/92
4-Aminobiphenyl	ND	50	1.0	01/18/92
Pentachlorophenol	ND	30	1.0	01/18/92
Pronamide	ND	50	1.0	01/18/92
Phenanthrene	ND	5.0	1.0	01/18/92
Anthracene	ND	5.0	1.0	01/18/92
Di-n-butylphthalate	ND	5.0	1.0	01/18/92
Fluoranthene	ND	5.0	1.0	01/18/92
Benzidine	ND	50	1.0	01/18/92
Pyrene	ND	5.0	1.0	01/18/92
p-Dimethylaminoazobenzene	ND	50	1.0	01/18/92
Butylbenzylphthalate	ND	5.0	1.0	01/18/92
3,3'-Dichlorobenzidine	ND	20	1.0	01/18/92
Benzo(a)anthracene	ND	5.0	1.0	01/18/92
Chrysene	ND	5.0	1.0	01/18/92
bis(2-Ethylhexyl)phthalate	ND	5.0	1.0	01/18/92
Di-n-octyl phthalate	ND	5.0	1.0	01/18/92
7,12-Dimethylbenz(a)anthrace	ND	50	1.0	01/18/92
Benzo(b)fluoranthene	ND	5.0	1.0	01/18/92
Benzo(k)fluoranthene	ND	5.0	1.0	01/18/92
Benzo(a)pyrene	ND	5.0	1.0	01/18/92
3-Methylcholanthrene	ND	50	1.0	01/18/92
Dibenz(a,j)acridine	ND	50	1.0	01/18/92
Indeno(1,2,3-cd)pyrene	ND	5.0	1.0	01/18/92
Dibenzo(a,h)anthracene	ND	5.0	1.0	01/18/92
Benzo(g,h,i)perylene	ND	5.0	1.0	01/18/92

Notes and Definitions for this Report:

EXTRACTED 01/17/92
ANALYST TT
FILE ID >AE750
UNITS ug/L
BATCH_ID 625-76
COMMENTS

Received: 01/16/92

Results by Sample

'AMPLE ID GW-03-07 FRACTION 07A TEST CODE 624 NAME Volatiles in water

Date & Time Collected 01/16/92 Category

PARAMETER	RESULT	LIMIT	D_F	DATE_ANAL
Dichlorodifluoromethane	ND	20	1.0	01/17/92
Chloromethane	ND	10	1.0	01/17/92
Vinyl Chloride	ND	10	1.0	01/17/92
Bromomethane	ND	10	1.0	01/17/92
Chloroethane	ND	10	1.0	01/17/92
Trichlorofluoromethane	ND	10	1.0	01/17/92
Ethanol	ND	20	1.0	01/17/92
1,1-Dichloroethene	8.0	3.0	1.0	01/17/92
Acrolein	ND	10	1.0	01/17/92
Acetone	ND	20	1.0	01/17/92
Iodomethane	ND	10	1.0	01/17/92
Carbon Disulfide	ND	5.0	1.0	01/17/92
Methylene chloride	7.0	5.0	1.0	01/17/92
Trans-1,2-Dichloroethene	ND	3.0	1.0	01/17/92
Acrylonitrile	ND	10	1.0	01/17/92
1,1-Dichloroethane	ND	3.0	1.0	01/17/92
2-Butanone	ND	20	1.0	01/17/92
cis-1,2-Dichloroethene	59	3.0	1.0	01/17/92
Chloroform	8.0	3.0	1.0	01/17/92
1,2-Dichloroethane	ND	3.0	1.0	01/17/92
Vinyl Acetate	ND	20	1.0	01/17/92
1,1,1-Trichloroethane	ND	3.0	1.0	01/17/92
Carbon Tetrachloride	ND	3.0	1.0	01/17/92
Benzene	ND	3.0	1.0	01/17/92
Trichloroethene	3200	3.0	1.0	01/17/92
1,2-Dichloropropane	ND	5.0	1.0	01/17/92
Bromodichloromethane	ND	3.0	1.0	01/17/92
Dibromomethane	ND	10	1.0	01/17/92
2-Chloroethyl vinyl ether	ND	10	1.0	01/17/92
cis-1,3-Dichloropropene	ND	3.0	1.0	01/17/92
trans-1,3-Dichloropropene	ND	5.0	1.0	01/17/92
Ethyl methacrylate	ND	10	1.0	01/17/92
1,1,2-Trichloroethane	ND	5.0	1.0	01/17/92
Dibromochloromethane	ND	3.0	1.0	01/17/92
Bromoform	ND	5.0	1.0	01/17/92
4-Methyl-2-Pentanone	ND	20	1.0	01/17/92
Toluene	ND	3.0	1.0	01/17/92
2-Hexanone	ND	20	1.0	01/17/92
1,1,2,2-Tetrachloroethane	ND	3.0	1.0	01/17/92
Tetrachloroethene	430	3.0	1.0	01/17/92
Chlorobenzene	ND	3.0	1.0	01/17/92
Ethylbenzene	ND	3.0	1.0	01/17/92
Xylene(total)	ND	3.0	1.0	01/17/92
Styrene	ND	3.0	1.0	01/17/92
cis-1,4-Dichloro-2-Butene	ND	10	1.0	01/17/92
1,2,3-Trichloropropane	ND	10	1.0	01/17/92
trans-1,4-Dichloro-2-Butene	ND	10	1.0	01/17/92

Notes and Definitions for this Report:

AMPLE ID OW-03-07 FRACTION 07A TEST CODE 624 NAME Volatiles in water
Date & Time Collected 01/16/92 Category

ANALYST CL
FILE ID >1V950; >1V959
UNITS ug/L
BATCH_ID VOA1-92-010
COMMENTS

Received: 01/16/92 Results by Sample

SAMPLE ID OW-03-08 FRACTION 08A TEST CODE 625 NAME Semi-Volatiles in water
Date & Time Collected 01/16/92 Category

PARAMETER	RESULT	LIMIT	D_F	DATE_ANAL
N-Nitrosodimethylamine	ND	10	1.0	01/18/92
2-Picoline	ND	50	1.0	01/18/92
Methyl_methanesulfonate	ND	50	1.0	01/18/92
Ethyl methanesulfonate	ND	50	1.0	01/18/92
Phenol	ND	10	1.0	01/18/92
Aniline	ND	10	1.0	01/18/92
bis(2-chloroethyl) ether	ND	5.0	1.0	01/18/92
2-Chlorophenol	ND	10	1.0	01/18/92
1,3-Dichlorobenzene	ND	5.0	1.0	01/18/92
1,4-Dichlorobenzene	ND	5.0	1.0	01/18/92
Benzyl alcohol	ND	10	1.0	01/18/92
1,2-Dichlorobenzene	ND	5.0	1.0	01/18/92
2-Methylphenol	ND	10	1.0	01/18/92
bis(2chloroisopropyl)ether	ND	5.0	1.0	01/18/92
Acetophenone	ND	50	1.0	01/18/92
4-Methylphenol	ND	10	1.0	01/18/92
N-Nitroso-di-n-propylamine	ND	5.0	1.0	01/18/92
Hexachloroethane	ND	5.0	1.0	01/18/92
Nitrobenzene	ND	5.0	1.0	01/18/92
N-Nitrosopiperidine	ND	50	1.0	01/18/92
Isophorone	ND	5.0	1.0	01/18/92
2-Nitrophenol	ND	10	1.0	01/18/92
2,4-Dimethylphenol	ND	10	1.0	01/18/92
Benzoic acid	ND	50	1.0	01/18/92
bis(2-Chloroethoxy)methane	ND	10	1.0	01/18/92
a,a-Dimethylphenethylamine	ND	50	1.0	01/18/92
2,4-Dichlorophenol	ND	10	1.0	01/18/92
1,2,4-Trichlorobenzene	ND	5.0	1.0	01/18/92
Naphthalene	ND	5.0	1.0	01/18/92
2,6-Dichlorophenol	ND	50	1.0	01/18/92
4-Chloroaniline	ND	20	1.0	01/18/92
Hexachlorobutadiene	ND	5.0	1.0	01/18/92
N-Nitroso-di-n-butylamine	ND	50	1.0	01/18/92
4-Chloro-3-methylphenol	ND	10	1.0	01/18/92
2-Methylnaphthalene	ND	5.0	1.0	01/18/92
1,2,4,5-Tetrachlorobenzene	ND	50	1.0	01/18/92
Hexachlorocyclopentadiene	ND	5.0	1.0	01/18/92
2,4,6-Trichlorophenol	ND	10	1.0	01/18/92
2,4,5-Trichlorophenol	ND	10	1.0	01/18/92
2-Chloronaphthalene	ND	5.0	1.0	01/18/92
1-Chloronaphthalene	ND	50	1.0	01/18/92
2-Nitroaniline	ND	50	1.0	01/18/92
Dimethyl phthalate	ND	5.0	1.0	01/18/92
Acenaphthylene	ND	5.0	1.0	01/18/92
2,6-Dinitrotoluene	ND	5.0	1.0	01/18/92
3-Nitroaniline	ND	50	1.0	01/18/92
Acenaphthene	ND	5.0	1.0	01/18/92
2,4-Dinitrophenol	ND	50	1.0	01/18/92
4-Nitrophenol	ND	50	1.0	01/18/92
Dibenzofuran	ND	5.0	1.0	01/18/92

Received: 01/16/92

ETAL REPORT
Results by Sample

Work Order # 92-[illegible]1-040
Continued From Above

SAMPLE ID OW-03-08 FRACTION 08A TEST CODE 625 NAME Semi-Volatiles in water
Date & Time Collected 01/16/92 Category

Pentachlorobenzene	ND	50	1.0	01/18/92
2,4-Dinitrotoluene	ND	5.0	1.0	01/18/92
1-Naphthylamine	ND	50	1.0	01/18/92
2-Naphthylamine	ND	50	1.0	01/18/92
2,3,4,6-Tetrachlorophenol	ND	50	1.0	01/18/92
Diethylphthalate	ND	5.0	1.0	01/18/92
4-Chlorophenyl-phenylether	ND	5.0	1.0	01/18/92
Fluorene	ND	5.0	1.0	01/18/92
4-Nitroaniline	ND	50	1.0	01/18/92
4,6-Dinitro-2-methylphenol	ND	50	1.0	01/18/92
Diphenylamine	ND	50	1.0	01/18/92
N-Nitrosodiphenylamine	ND	10	1.0	01/18/92
Azobenzene	ND	5.0	1.0	01/18/92
4-Bromophenyl-phenylether	ND	5.0	1.0	01/18/92
Phenacetin	ND	50	1.0	01/18/92
Hexachlorobenzene	ND	5.0	1.0	01/18/92
4-Aminobiphenyl	ND	50	1.0	01/18/92
Pentachlorophenol	ND	30	1.0	01/18/92
Pronamide	ND	50	1.0	01/18/92
Phenanthrene	ND	5.0	1.0	01/18/92
Anthracene	ND	5.0	1.0	01/18/92
Di-n-butylphthalate	ND	5.0	1.0	01/18/92
Fluoranthene	ND	5.0	1.0	01/18/92
Benzidine	ND	50	1.0	01/18/92
Pyrene	ND	5.0	1.0	01/18/92
p-Dimethylaminoazobenzene	ND	50	1.0	01/18/92
Butylbenzylphthalate	ND	5.0	1.0	01/18/92
3,3'-Dichlorobenzidine	ND	20	1.0	01/18/92
Benzo(a)anthracene	ND	5.0	1.0	01/18/92
Chrysene	ND	5.0	1.0	01/18/92
bis(2-Ethylhexyl)phthalate	ND	5.0	1.0	01/18/92
Di-n-octyl phthalate	ND	5.0	1.0	01/18/92
7,12-Dimethylbenz(a)anthrace	ND	50	1.0	01/18/92
Benzo(b)fluoranthene	ND	5.0	1.0	01/18/92
Benzo(k)fluoranthene	ND	5.0	1.0	01/18/92
Benzo(a)pyrene	ND	5.0	1.0	01/18/92
3-Methylcholanthrene	ND	50	1.0	01/18/92
Dibenz(a,j)acridine	ND	50	1.0	01/18/92
Indeno(1,2,3-cd)pyrene	ND	5.0	1.0	01/18/92
Dibenzo(a,h)anthracene	ND	5.0	1.0	01/18/92
Benzo(g,h,i)perylene	ND	5.0	1.0	01/18/92

Notes and Definitions for this Report:

EXTRACTED 01/17/92
ANALYST TT
FILE ID >AE751
UNITS ug/L
BATCH_ID 625-76
COMMENTS

Received: 01/16/92

Results by Sample

SAMPLE ID OW-04-09 FRACTION 09A TEST CODE 624 NAME Volatiles in water
Date & Time Collected 01/16/92 Category

PARAMETER	RESULT	LIMIT	D_F	DATE_ANAL
Dichlorodifluoromethane	ND	20	1.0	01/17/92
Chloromethane	ND	10	1.0	01/17/92
Vinyl Chloride	ND	10	1.0	01/17/92
Bromomethane	ND	10	1.0	01/17/92
Chloroethane	ND	10	1.0	01/17/92
Trichlorofluoromethane	ND	10	1.0	01/17/92
Ethanol	ND	20	1.0	01/17/92
1,1-Dichloroethene	33	3.0	1.0	01/17/92
Acrolein	ND	10	1.0	01/17/92
Acetone	ND	20	1.0	01/17/92
Iodomethane	ND	10	1.0	01/17/92
Carbon Disulfide	ND	5.0	1.0	01/17/92
Methylene chloride	5.0	5.0	1.0	01/17/92
Trans-1,2-Dichloroethene	ND	3.0	1.0	01/17/92
Acrylonitrile	ND	10	1.0	01/17/92
1,1-Dichloroethane	ND	3.0	1.0	01/17/92
2-Butanone	ND	20	1.0	01/17/92
cis-1,2-Dichloroethene	190	3.0	1.0	01/17/92
Chloroform	19	3.0	1.0	01/17/92
1,2-Dichloroethane	ND	3.0	1.0	01/17/92
Vinyl Acetate	ND	20	1.0	01/17/92
1,1,1-Trichloroethane	ND	3.0	1.0	01/17/92
Carbon Tetrachloride	ND	3.0	1.0	01/17/92
Benzene	7.0	3.0	1.0	01/17/92
Trichloroethene	5500	3.0	100	01/17/92
1,2-Dichloropropane	ND	5.0	1.0	01/17/92
Bromodichloromethane	ND	3.0	1.0	01/17/92
Dibromomethane	ND	10	1.0	01/17/92
2-Chloroethyl vinyl ether	ND	10	1.0	01/17/92
cis-1,3-Dichloropropene	ND	3.0	1.0	01/17/92
trans-1,3-Dichloropropene	ND	5.0	1.0	01/17/92
Ethyl methacrylate	ND	10	1.0	01/17/92
1,1,2-Trichloroethane	ND	5.0	1.0	01/17/92
Dibromochloromethane	ND	3.0	1.0	01/17/92
Bromoform	ND	5.0	1.0	01/17/92
4-Methyl-2-Pentanone	ND	20	1.0	01/17/92
Toluene	ND	3.0	1.0	01/17/92
2-Hexanone	ND	20	1.0	01/17/92
1,1,2,2-Tetrachloroethane	ND	3.0	1.0	01/17/92
Tetrachloroethene	1300	3.0	100	01/17/92
Chlorobenzene	ND	3.0	1.0	01/17/92
Ethylbenzene	ND	3.0	1.0	01/17/92
Xylene(total)	ND	3.0	1.0	01/17/92
Styrene	ND	3.0	1.0	01/17/92
cis-1,4-Dichloro-2-Butene	ND	10	1.0	01/17/92
1,2,3-Trichloropropane	ND	10	1.0	01/17/92
trans-1,4-Dichloro-2-Butene	ND	10	1.0	01/17/92

Notes and Definitions for this Report:

AMPLE ID OW-04-09 FRACTION 09A TEST CODE 624 NAME Volatiles in water
Date & Time Collected 01/16/92 Category

ANALYST CL
FILE ID >2B918; >1V951
UNITS ug/L
BATCH_ID *
COMMENTS * = VOA2-92-006; VOA1-92-010

AMPLE ID OW-04-10 FRACTION 10A TEST CODE 625 NAME Semi-Volatiles in water
Date & Time Collected 01/16/92 Category

PARAMETER	RESULT	LIMIT	D_F	DATE_ANAL
N-Nitrosodimethylamine	ND	10	1.0	01/18/92
2-Picoline	ND	50	1.0	01/18/92
Methyl_methanesulfonate	ND	50	1.0	01/18/92
Ethyl methanesulfonate	ND	50	1.0	01/18/92
Phenol	ND	10	1.0	01/18/92
Aniline	ND	10	1.0	01/18/92
bis(2-chloroethyl) ether	ND	5.0	1.0	01/18/92
2-Chlorophenol	ND	10	1.0	01/18/92
1,3-Dichlorobenzene	ND	5.0	1.0	01/18/92
1,4-Dichlorobenzene	ND	5.0	1.0	01/18/92
Benzyl alcohol	ND	10	1.0	01/18/92
1,2-Dichlorobenzene	ND	5.0	1.0	01/18/92
2-Methylphenol	ND	10	1.0	01/18/92
bis(2chloroisopropyl)ether	ND	5.0	1.0	01/18/92
Acetophenone	ND	50	1.0	01/18/92
4-Methylphenol	ND	10	1.0	01/18/92
N-Nitroso-di-n-propylamine	ND	5.0	1.0	01/18/92
Hexachloroethane	ND	5.0	1.0	01/18/92
Nitrobenzene	ND	5.0	1.0	01/18/92
N-Nitrosopiperidine	ND	50	1.0	01/18/92
Isophorone	ND	5.0	1.0	01/18/92
2-Nitrophenol	ND	10	1.0	01/18/92
2,4-Dimethylphenol	ND	10	1.0	01/18/92
Benzoic acid	ND	50	1.0	01/18/92
bis(2-Chloroethoxy)methane	ND	10	1.0	01/18/92
a,a-Dimethylphenethylamine	ND	50	1.0	01/18/92
2,4-Dichlorophenol	ND	10	1.0	01/18/92
1,2,4-Trichlorobenzene	ND	5.0	1.0	01/18/92
Naphthalene	ND	5.0	1.0	01/18/92
2,6-Dichlorophenol	ND	50	1.0	01/18/92
4-Chloroaniline	ND	20	1.0	01/18/92
Hexachlorobutadiene	ND	5.0	1.0	01/18/92
N-Nitroso-di-n-butylamine	ND	50	1.0	01/18/92
4-Chloro-3-methylphenol	ND	10	1.0	01/18/92
2-Methylnaphthalene	ND	5.0	1.0	01/18/92
1,2,4,5-Tetrachlorobenzene	ND	50	1.0	01/18/92
Hexachlorocyclopentadiene	ND	5.0	1.0	01/18/92
2,4,6-Trichlorophenol	ND	10	1.0	01/18/92
2,4,5-Trichlorophenol	ND	10	1.0	01/18/92
2-Chloronaphthalene	ND	5.0	1.0	01/18/92
1-Chloronaphthalene	ND	50	1.0	01/18/92
2-Nitroaniline	ND	50	1.0	01/18/92
Dimethyl phthalate	ND	5.0	1.0	01/18/92
Acenaphthylene	ND	5.0	1.0	01/18/92
2,6-Dinitrotoluene	ND	5.0	1.0	01/18/92
3-Nitroaniline	ND	50	1.0	01/18/92
Acenaphthene	ND	5.0	1.0	01/18/92
2,4-Dinitrophenol	ND	50	1.0	01/18/92
4-Nitrophenol	ND	50	1.0	01/18/92
Dibenzofuran	ND	5.0	1.0	01/18/92

SAMPLE ID OW-04-10 FRACTION 10A TEST CODE 625 NAME Semi-Volatiles in water
Date & Time Collected 01/16/92 Category

Pentachlorobenzene	ND	50	1.0	01/18/92
2,4-Dinitrotoluene	ND	5.0	1.0	01/18/92
1-Naphthylamine	ND	50	1.0	01/18/92
2-Naphthylamine	ND	50	1.0	01/18/92
2,3,4,6-Tetrachlorophenol	ND	50	1.0	01/18/92
Diethylphthalate	ND	5.0	1.0	01/18/92
4-Chlorophenyl-phenylether	ND	5.0	1.0	01/18/92
Fluorene	ND	5.0	1.0	01/18/92
4-Nitroaniline	ND	50	1.0	01/18/92
4,6-Dinitro-2-methylphenol	ND	50	1.0	01/18/92
Diphenylamine	ND	50	1.0	01/18/92
N-Nitrosodiphenylamine	ND	10	1.0	01/18/92
Azobenzene	ND	5.0	1.0	01/18/92
4-Bromophenyl-phenylether	ND	5.0	1.0	01/18/92
Phenacetin	ND	50	1.0	01/18/92
Hexachlorobenzene	ND	5.0	1.0	01/18/92
4-Aminobiphenyl	ND	50	1.0	01/18/92
Pentachlorophenol	ND	30	1.0	01/18/92
Pronamide	ND	50	1.0	01/18/92
Phenanthrene	ND	5.0	1.0	01/18/92
Anthracene	ND	5.0	1.0	01/18/92
Di-n-butylphthalate	ND	5.0	1.0	01/18/92
Fluoranthene	ND	5.0	1.0	01/18/92
Benzidine	ND	50	1.0	01/18/92
Pyrene	ND	5.0	1.0	01/18/92
p-Dimethylaminoazobenzene	ND	50	1.0	01/18/92
Butylbenzylphthalate	ND	5.0	1.0	01/18/92
3,3'-Dichlorobenzidine	ND	20	1.0	01/18/92
Benzo(a)anthracene	ND	5.0	1.0	01/18/92
Chrysene	ND	5.0	1.0	01/18/92
bis(2-Ethylhexyl)phthalate	ND	5.0	1.0	01/18/92
Di-n-octyl phthalate	ND	5.0	1.0	01/18/92
7,12-Dimethylbenz(a)anthrace	ND	50	1.0	01/18/92
Benzo(b)fluoranthene	ND	5.0	1.0	01/18/92
Benzo(k)fluoranthene	ND	5.0	1.0	01/18/92
Benzo(a)pyrene	ND	5.0	1.0	01/18/92
3-Methylcholanthrene	ND	50	1.0	01/18/92
Dibenz(a,j)acridine	ND	50	1.0	01/18/92
Indeno(1,2,3-cd)pyrene	ND	5.0	1.0	01/18/92
Dibenzo(a,h)anthracene	ND	5.0	1.0	01/18/92
Benzo(g,h,i)perylene	ND	5.0	1.0	01/18/92

Notes and Definitions for this Report:

EXTRACTED 01/17/92
ANALYST TT
FILE ID >AE752
UNITS ug/L
BATCH_ID 625-76
COMMENTS

Received: 01/16/92 Results by Sample

AMPLE ID OW-05-11 FRACTION 11A TEST CODE 624 NAME Volatiles in water
Date & Time Collected 01/16/92 Category

PARAMETER	RESULT	LIMIT	D_F	DATE_ANAL
Dichlorodifluoromethane	ND	20	1.0	01/17/92
Chloromethane	ND	10	1.0	01/17/92
Vinyl Chloride	ND	10	1.0	01/17/92
Bromomethane	ND	10	1.0	01/17/92
Chloroethane	ND	10	1.0	01/17/92
Trichlorofluoromethane	14	10	1.0	01/17/92
Ethanol	ND	20	1.0	01/17/92
1,1-Dichloroethene	150	3.0	1.0	01/17/92
Acrolein	ND	10	1.0	01/17/92
Acetone	ND	20	1.0	01/17/92
Iodomethane	ND	10	1.0	01/17/92
Carbon Disulfide	ND	5.0	1.0	01/17/92
Methylene chloride	6.0	5.0	1.0	01/17/92
Trans-1,2-Dichloroethene	ND	3.0	1.0	01/17/92
Acrylonitrile	ND	10	1.0	01/17/92
1,1-Dichloroethane	10	3.0	1.0	01/17/92
2-Butanone	ND	20	1.0	01/17/92
cis-1,2-Dichloroethene	560	3.0	1.0	01/17/92
Chloroform	34	3.0	1.0	01/17/92
1,2-Dichloroethane	ND	3.0	1.0	01/17/92
Vinyl Acetate	ND	20	1.0	01/17/92
1,1,1-Trichloroethane	ND	3.0	1.0	01/17/92
Carbon Tetrachloride	ND	3.0	1.0	01/17/92
Benzene	22	3.0	1.0	01/17/92
Trichloroethene	14000	3.0	100	01/17/92
1,2-Dichloropropane	ND	5.0	1.0	01/17/92
Bromodichloromethane	ND	3.0	1.0	01/17/92
Dibromomethane	ND	10	1.0	01/17/92
2-Chloroethyl vinyl ether	ND	10	1.0	01/17/92
cis-1,3-Dichloropropene	ND	3.0	1.0	01/17/92
trans-1,3-Dichloropropene	ND	5.0	1.0	01/17/92
Ethyl methacrylate	ND	10	1.0	01/17/92
1,1,2-Trichloroethane	ND	5.0	1.0	01/17/92
Dibromochloromethane	ND	3.0	1.0	01/17/92
Bromoform	ND	5.0	1.0	01/17/92
4-Methyl-2-Pentanone	ND	20	1.0	01/17/92
Toluene	ND	3.0	1.0	01/17/92
2-Hexanone	ND	20	1.0	01/17/92
1,1,2,2-Tetrachloroethane	ND	3.0	1.0	01/17/92
Tetrachloroethene	5000	3.0	100	01/17/92
Chlorobenzene	ND	3.0	1.0	01/17/92
Ethylbenzene	ND	3.0	1.0	01/17/92
Xylene(total)	ND	3.0	1.0	01/17/92
Styrene	ND	3.0	1.0	01/17/92
cis-1,4-Dichloro-2-Butene	ND	10	1.0	01/17/92
1,2,3-Trichloropropane	ND	10	1.0	01/17/92
trans-1,4-Dichloro-2-Butene	ND	10	1.0	01/17/92

Notes and Definitions for this Report:

SAMPLE ID OW-05-11 FRACTION 11A TEST CODE 624 NAME Volatiles in water
Date & Time Collected 01/16/92 Category

ANALYST CL
FILE ID >1V952; >2B919
UNITS ug/L
BATCH_ID *
COMMENTS * = VOA1-92-010; VOA2-92-006

Received: 01/16/92 Results by Sample

AMPLE ID OW-05-12 FRACTION 12A TEST CODE 625 NAME Semi-Volatiles in water
Date & Time Collected 01/16/92 Category

PARAMETER	RESULT	LIMIT	D_F	DATE_ANAL
N-Nitrosodimethylamine	ND	10	1.0	01/18/92
2-Picoline	ND	50	1.0	01/18/92
Methyl_methanesulfonate	ND	50	1.0	01/18/92
Ethyl methanesulfonate	ND	50	1.0	01/18/92
Phenol	ND	10	1.0	01/18/92
Aniline	ND	10	1.0	01/18/92
bis(2-chloroethyl) ether	ND	5.0	1.0	01/18/92
2-Chlorophenol	ND	10	1.0	01/18/92
1,3-Dichlorobenzene	ND	5.0	1.0	01/18/92
1,4-Dichlorobenzene	ND	5.0	1.0	01/18/92
Benzyl alcohol	ND	10	1.0	01/18/92
1,2-Dichlorobenzene	ND	5.0	1.0	01/18/92
2-Methylphenol	ND	10	1.0	01/18/92
bis(2chloroisopropyl)ether	ND	5.0	1.0	01/18/92
Acetophenone	ND	50	1.0	01/18/92
4-Methylphenol	ND	10	1.0	01/18/92
N-Nitroso-di-n-propylamine	ND	5.0	1.0	01/18/92
Hexachloroethane	ND	5.0	1.0	01/18/92
Nitrobenzene	ND	5.0	1.0	01/18/92
N-Nitrosopiperidine	ND	50	1.0	01/18/92
Isophorone	ND	5.0	1.0	01/18/92
2-Nitrophenol	ND	10	1.0	01/18/92
2,4-Dimethylphenol	ND	10	1.0	01/18/92
Benzoic acid	ND	50	1.0	01/18/92
bis(2-Chloroethoxy)methane	ND	10	1.0	01/18/92
a,a-Dimethylphenethylamine	ND	50	1.0	01/18/92
2,4-Dichlorophenol	ND	10	1.0	01/18/92
1,2,4-Trichlorobenzene	ND	5.0	1.0	01/18/92
Naphthalene	ND	5.0	1.0	01/18/92
2,6-Dichlorophenol	ND	50	1.0	01/18/92
4-Chloroaniline	ND	20	1.0	01/18/92
Hexachlorobutadiene	ND	5.0	1.0	01/18/92
N-Nitroso-di-n-butylamine	ND	50	1.0	01/18/92
4-Chloro-3-methylphenol	ND	10	1.0	01/18/92
2-Methylnaphthalene	ND	5.0	1.0	01/18/92
1,2,4,5-Tetrachlorobenzene	ND	50	1.0	01/18/92
Hexachlorocyclopentadiene	ND	5.0	1.0	01/18/92
2,4,6-Trichlorophenol	ND	10	1.0	01/18/92
2,4,5-Trichlorophenol	ND	10	1.0	01/18/92
2-Chloronaphthalene	ND	5.0	1.0	01/18/92
1-Chloronaphthalene	ND	50	1.0	01/18/92
2-Nitroaniline	ND	50	1.0	01/18/92
Dimethyl phthalate	ND	5.0	1.0	01/18/92
Acenaphthylene	ND	5.0	1.0	01/18/92
2,6-Dinitrotoluene	ND	5.0	1.0	01/18/92
3-Nitroaniline	ND	50	1.0	01/18/92
Acenaphthene	ND	5.0	1.0	01/18/92
2,4-Dinitrophenol	ND	50	1.0	01/18/92
4-Nitrophenol	ND	50	1.0	01/18/92
Dibenzofuran	ND	5.0	1.0	01/18/92

SAMPLE ID 03-05-12 FRACTION 12A TEST CODE 625 NAME Semi-Volatiles in water
Date & Time Collected 01/16/92 Category

Pentachlorobenzene	ND	50	1.0	01/18/92
2,4-Dinitrotoluene	ND	5.0	1.0	01/18/92
1-Naphthylamine	ND	50	1.0	01/18/92
2-Naphthylamine	ND	50	1.0	01/18/92
2,3,4,6-Tetrachlorophenol	ND	50	1.0	01/18/92
Diethylphthalate	ND	5.0	1.0	01/18/92
4-Chlorophenyl-phenylether	ND	5.0	1.0	01/18/92
Fluorene	ND	5.0	1.0	01/18/92
4-Nitroaniline	ND	50	1.0	01/18/92
4,6-Dinitro-2-methylphenol	ND	50	1.0	01/18/92
Diphenylamine	ND	50	1.0	01/18/92
N-Nitrosodiphenylamine	ND	10	1.0	01/18/92
Azobenzene	ND	5.0	1.0	01/18/92
4-Bromophenyl-phenylether	ND	5.0	1.0	01/18/92
Phenacetin	ND	50	1.0	01/18/92
Hexachlorobenzene	ND	5.0	1.0	01/18/92
4-Aminobiphenyl	ND	50	1.0	01/18/92
Pentachlorophenol	ND	30	1.0	01/18/92
Pronamide	ND	50	1.0	01/18/92
Phenanthrene	ND	5.0	1.0	01/18/92
Anthracene	ND	5.0	1.0	01/18/92
Di-n-butylphthalate	ND	5.0	1.0	01/18/92
Fluoranthene	ND	5.0	1.0	01/18/92
Benzidine	ND	50	1.0	01/18/92
Pyrene	ND	5.0	1.0	01/18/92
p-Dimethylaminoazobenzene	ND	50	1.0	01/18/92
Butylbenzylphthalate	ND	5.0	1.0	01/18/92
3,3'-Dichlorobenzidine	ND	20	1.0	01/18/92
Benzo(a)anthracene	ND	5.0	1.0	01/18/92
Chrysene	ND	5.0	1.0	01/18/92
bis(2-Ethylhexyl)phthalate	ND	5.0	1.0	01/18/92
Di-n-octyl phthalate	ND	5.0	1.0	01/18/92
7,12-Dimethylbenz(a)anthrace	ND	50	1.0	01/18/92
Benzo(b)fluoranthene	ND	5.0	1.0	01/18/92
Benzo(k)fluoranthene	ND	5.0	1.0	01/18/92
Benzo(a)pyrene	ND	5.0	1.0	01/18/92
3-Methylcholanthrene	ND	50	1.0	01/18/92
Dibenz(a,j)acridine	ND	50	1.0	01/18/92
Indeno(1,2,3-cd)pyrene	ND	5.0	1.0	01/18/92
Dibenzo(a,h)anthracene	ND	5.0	1.0	01/18/92
Benzo(g,h,i)perylene	ND	5.0	1.0	01/18/92

Notes and Definitions for this Report:

EXTRACTED 01/17/92
ANALYST TT
FILE ID >AE756
UNITS ug/L
BATCH_ID 625-76
COMMENTS

MPLE ID GW-06-13 FRACTION 13A TEST CODE 624 NAME Volatiles in water
Date & Time Collected 01/16/92 Category

PARAMETER	RESULT	LIMIT	D_F	DATE_ANAL
Dichlorodifluoromethane	ND	20	1.0	01/17/92
Chloromethane	ND	10	1.0	01/17/92
Vinyl Chloride	ND	10	1.0	01/17/92
Bromomethane	ND	10	1.0	01/17/92
Chloroethane	ND	10	1.0	01/17/92
Trichlorofluoromethane	ND	10	1.0	01/17/92
Ethanol	ND	20	1.0	01/17/92
1,1-Dichloroethene	130	3.0	1.0	01/17/92
Acrolein	ND	10	1.0	01/17/92
Acetone	ND	20	1.0	01/17/92
Iodomethane	ND	10	1.0	01/17/92
Carbon Disulfide	ND	5.0	1.0	01/17/92
Methylene chloride	ND	5.0	1.0	01/17/92
Trans-1,2-Dichloroethene	ND	3.0	1.0	01/17/92
Acrylonitrile	ND	10	1.0	01/17/92
1,1-Dichloroethane	11	3.0	1.0	01/17/92
2-Butanone	ND	20	1.0	01/17/92
cis-1,2-Dichloroethene	300	3.0	1.0	01/17/92
Chloroform	69	3.0	1.0	01/17/92
1,2-Dichloroethane	ND	3.0	1.0	01/17/92
Vinyl Acetate	ND	20	1.0	01/17/92
1,1,1-Trichloroethane	ND	3.0	1.0	01/17/92
Carbon Tetrachloride	ND	3.0	1.0	01/17/92
Benzene	28	3.0	1.0	01/17/92
Trichloroethene	21000	3.0	100	01/17/92
1,2-Dichloropropane	ND	5.0	1.0	01/17/92
Bromodichloromethane	ND	3.0	1.0	01/17/92
Dibromomethane	ND	10	1.0	01/17/92
2-Chloroethyl vinyl ether	ND	10	1.0	01/17/92
cis-1,3-Dichloropropene	ND	3.0	1.0	01/17/92
trans-1,3-Dichloropropene	ND	5.0	1.0	01/17/92
Ethyl methacrylate	ND	10	1.0	01/17/92
1,1,2-Trichloroethane	ND	5.0	1.0	01/17/92
Dibromochloromethane	ND	3.0	1.0	01/17/92
Bromoform	ND	5.0	1.0	01/17/92
4-Methyl-2-Pentanone	ND	20	1.0	01/17/92
Toluene	ND	3.0	1.0	01/17/92
2-Hexanone	ND	20	1.0	01/17/92
1,1,2,2-Tetrachloroethane	ND	3.0	1.0	01/17/92
Tetrachloroethene	9400	3.0	100	01/17/92
Chlorobenzene	ND	3.0	1.0	01/17/92
Ethylbenzene	ND	3.0	1.0	01/17/92
Xylene(total)	ND	3.0	1.0	01/17/92
Styrene	ND	3.0	1.0	01/17/92
cis-1,4-Dichloro-2-Butene	ND	10	1.0	01/17/92
1,2,3-Trichloropropane	ND	10	1.0	01/17/92
trans-1,4-Dichloro-2-Butene	ND	10	1.0	01/17/92

Notes and Definitions for this Report:

Received: 01/16/92

ETAL REPORT
Results by Sample

Work Order # 92-01-040
Continued From Above

SAMPLE ID OW-06-13

FRACTION 13A TEST CODE 624 NAME Volatiles in water
Date & Time Collected 01/16/92 Category

ANALYST CL
FILE ID >2B920; >1V953
UNITS ug/L
BATCH_ID *
COMMENTS * = VOA2-92-006; VOA1-92-010

Received: 01/16/92 Results by Sample

SAMPLE ID OW-06-14 FRACTION 14A TEST CODE 625 NAME Semi-Volatiles in water
Date & Time Collected 01/16/92 Category

PARAMETER	RESULT	LIMIT	D_F	DATE_ANAL
N-Nitrosodimethylamine	ND	10	1.0	01/18/92
2-Picoline	ND	50	1.0	01/18/92
Methyl_methanesulfonate	ND	50	1.0	01/18/92
Ethyl methanesulfonate	ND	50	1.0	01/18/92
Phenol	ND	10	1.0	01/18/92
Aniline	ND	10	1.0	01/18/92
bis(2-chloroethyl) ether	ND	5.0	1.0	01/18/92
2-Chlorophenol	ND	10	1.0	01/18/92
1,3-Dichlorobenzene	ND	5.0	1.0	01/18/92
1,4-Dichlorobenzene	ND	5.0	1.0	01/18/92
Benzyl alcohol	ND	10	1.0	01/18/92
1,2-Dichlorobenzene	5.0	5.0	1.0	01/18/92
2-Methylphenol	ND	10	1.0	01/18/92
bis(2chloroisopropyl)ether	ND	5.0	1.0	01/18/92
Acetophenone	ND	50	1.0	01/18/92
4-Methylphenol	ND	10	1.0	01/18/92
N-Nitroso-di-n-propylamine	ND	5.0	1.0	01/18/92
Hexachloroethane	ND	5.0	1.0	01/18/92
Nitrobenzene	ND	5.0	1.0	01/18/92
N-Nitrosopiperidine	ND	50	1.0	01/18/92
Isophorone	ND	5.0	1.0	01/18/92
2-Nitrophenol	ND	10	1.0	01/18/92
2,4-Dimethylphenol	ND	10	1.0	01/18/92
Benzoic acid	ND	50	1.0	01/18/92
bis(2-Chloroethoxy)methane	ND	10	1.0	01/18/92
a,a-Dimethylphenethylamine	ND	50	1.0	01/18/92
2,4-Dichlorophenol	ND	10	1.0	01/18/92
1,2,4-Trichlorobenzene	ND	5.0	1.0	01/18/92
Naphthalene	ND	5.0	1.0	01/18/92
2,6-Dichlorophenol	ND	50	1.0	01/18/92
4-Chloroaniline	ND	20	1.0	01/18/92
Hexachlorobutadiene	ND	5.0	1.0	01/18/92
N-Nitroso-di-n-butylamine	ND	50	1.0	01/18/92
4-Chloro-3-methylphenol	ND	10	1.0	01/18/92
2-Methylnaphthalene	ND	5.0	1.0	01/18/92
1,2,4,5-Tetrachlorobenzene	ND	50	1.0	01/18/92
Hexachlorocyclopentadiene	ND	5.0	1.0	01/18/92
2,4,6-Trichlorophenol	ND	10	1.0	01/18/92
2,4,5-Trichlorophenol	ND	10	1.0	01/18/92
2-Chloronaphthalene	ND	5.0	1.0	01/18/92
1-Chloronaphthalene	ND	50	1.0	01/18/92
2-Nitroaniline	ND	50	1.0	01/18/92
Dimethyl phthalate	ND	5.0	1.0	01/18/92
Acenaphthylene	ND	5.0	1.0	01/18/92
2,6-Dinitrotoluene	ND	5.0	1.0	01/18/92
3-Nitroaniline	ND	50	1.0	01/18/92
Acenaphthene	ND	5.0	1.0	01/18/92
2,4-Dinitrophenol	ND	50	1.0	01/18/92
4-Nitrophenol	ND	50	1.0	01/18/92
Dibenzofuran	ND	5.0	1.0	01/18/92

MPLE ID OW-06-14 FRACTION 14A TEST CODE 625 NAME Semi-Volatiles in water
Date & Time Collected 01/16/92 Category

Pentachlorobenzene	ND	50	1.0	01/18/92
2,4-Dinitrotoluene	ND	5.0	1.0	01/18/92
1-Naphthylamine	ND	50	1.0	01/18/92
2-Naphthylamine	ND	50	1.0	01/18/92
2,3,4,6-Tetrachlorophenol	ND	50	1.0	01/18/92
Diethylphthalate	ND	5.0	1.0	01/18/92
4-Chlorophenyl-phenylether	ND	5.0	1.0	01/18/92
Fluorene	ND	5.0	1.0	01/18/92
4-Nitroaniline	ND	50	1.0	01/18/92
4,6-Dinitro-2-methylphenol	ND	50	1.0	01/18/92
Diphenylamine	ND	50	1.0	01/18/92
N-Nitrosodiphenylamine	ND	10	1.0	01/18/92
Azobenzene	ND	5.0	1.0	01/18/92
4-Bromophenyl-phenylether	ND	5.0	1.0	01/18/92
Phenacetin	ND	50	1.0	01/18/92
Hexachlorobenzene	ND	5.0	1.0	01/18/92
4-Aminobiphenyl	ND	50	1.0	01/18/92
Pentachlorophenol	ND	30	1.0	01/18/92
Pronamide	ND	50	1.0	01/18/92
Phenanthrene	ND	5.0	1.0	01/18/92
Anthracene	ND	5.0	1.0	01/18/92
Di-n-butylphthalate	ND	5.0	1.0	01/18/92
Fluoranthene	ND	5.0	1.0	01/18/92
Benzidine	ND	50	1.0	01/18/92
Pyrene	ND	5.0	1.0	01/18/92
p-Dimethylaminoazobenzene	ND	50	1.0	01/18/92
Butylbenzylphthalate	ND	5.0	1.0	01/18/92
3,3'-Dichlorobenzidine	ND	20	1.0	01/18/92
Benzo(a)anthracene	ND	5.0	1.0	01/18/92
Chrysene	ND	5.0	1.0	01/18/92
bis(2-Ethylhexyl)phthalate	ND	5.0	1.0	01/18/92
Di-n-octyl phthalate	ND	5.0	1.0	01/18/92
7,12-Dimethylbenz(a)anthrace	ND	50	1.0	01/18/92
Benzo(b)fluoranthene	ND	5.0	1.0	01/18/92
Benzo(k)fluoranthene	ND	5.0	1.0	01/18/92
Benzo(a)pyrene	ND	5.0	1.0	01/18/92
3-Methylcholanthrene	ND	50	1.0	01/18/92
Dibenz(a,j)acridine	ND	50	1.0	01/18/92
Indeno(1,2,3-cd)pyrene	ND	5.0	1.0	01/18/92
Dibenzo(a,h)anthracene	ND	5.0	1.0	01/18/92
Benzo(g,h,i)perylene	ND	5.0	1.0	01/18/92

Notes and Definitions for this Report:

EXTRACTED 01/17/92
ANALYST TT
FILE ID >AE753
UNITS ug/L
BATCH_ID 625-76
COMMENTS

SAMPLE ID GW-00-15 FRACTION 15A TEST CODE 624 NAME Volatiles in water
Date & Time Collected 01/16/92 Category

PARAMETER	RESULT	LIMIT	D_F	DATE_ANAL
Dichlorodifluoromethane	ND	20	100	01/17/92
Chloromethane	ND	10	100	01/17/92
Vinyl Chloride	ND	10	100	01/17/92
Bromomethane	ND	10	100	01/17/92
Chloroethane	ND	10	100	01/17/92
Trichlorofluoromethane	ND	10	100	01/17/92
Ethanol	ND	20	100	01/17/92
1,1-Dichloroethene	ND	3.0	100	01/17/92
Acrolein	ND	10	100	01/17/92
Acetone	ND	20	100	01/17/92
Iodomethane	ND	10	100	01/17/92
Carbon Disulfide	ND	5.0	100	01/17/92
Methylene chloride	ND	5.0	100	01/17/92
Trans-1,2-Dichloroethene	ND	3.0	100	01/17/92
Acrylonitrile	ND	10	100	01/17/92
1,1-Dichloroethane	ND	3.0	100	01/17/92
2-Butanone	ND	20	100	01/17/92
cis-1,2-Dichloroethene	ND	3.0	100	01/17/92
Chloroform	ND	3.0	100	01/17/92
1,2-Dichloroethane	ND	3.0	100	01/17/92
Vinyl Acetate	ND	20	100	01/17/92
1,1,1-Trichloroethane	ND	3.0	100	01/17/92
Carbon Tetrachloride	ND	3.0	100	01/17/92
Benzene	ND	3.0	100	01/17/92
Trichloroethene	ND	3.0	100	01/17/92
1,2-Dichloropropane	ND	5.0	100	01/17/92
Bromodichloromethane	ND	3.0	100	01/17/92
Dibromomethane	ND	10	100	01/17/92
2-Chloroethyl vinyl ether	ND	10	100	01/17/92
cis-1,3-Dichloropropene	ND	3.0	100	01/17/92
trans-1,3-Dichloropropene	ND	5.0	100	01/17/92
Ethyl methacrylate	ND	10	100	01/17/92
1,1,2-Trichloroethane	ND	5.0	100	01/17/92
Dibromochloromethane	ND	3.0	100	01/17/92
Bromoform	ND	5.0	100	01/17/92
4-Methyl-2-Pentanone	ND	20	100	01/17/92
Toluene	ND	3.0	100	01/17/92
2-Hexanone	ND	20	100	01/17/92
1,1,2,2-Tetrachloroethane	ND	3.0	100	01/17/92
Tetrachloroethene	ND	3.0	100	01/17/92
Chlorobenzene	ND	3.0	100	01/17/92
Ethylbenzene	ND	3.0	100	01/17/92
Xylene(total)	ND	3.0	100	01/17/92
Styrene	ND	3.0	100	01/17/92
cis-1,4-Dichloro-2-Butene	ND	10	100	01/17/92
1,2,3-Trichloropropane	ND	10	100	01/17/92
trans-1,4-Dichloro-2-Butene	ND	10	100	01/17/92

Notes and Definitions for this Report:

Received: 01/16/92 Results by Sample Continued From Above

SAMPLE ID OW-00-15 FRACTION 15A TEST CODE 624 NAME Volatiles in water
Date & Time Collected 01/16/92 Category

ANALYST CL
FILE ID >2B921
UNITS ug/L
BATCH_ID VOA-92-006
COMMENTS

Received: 01/16/92

Results by Sample

MPLE ID OW-00-16 FRACTION 16A TEST CODE 625 NAME Semi-Volatiles in water

Date & Time Collected 01/16/92 Category

PARAMETER	RESULT	LIMIT	D_F	DATE_ANAL
N-Nitrosodimethylamine	ND	10	1.0	01/18/92
2-Picoline	ND	50	1.0	01/18/92
Methyl_methanesulfonate	ND	50	1.0	01/18/92
Ethyl methanesulfonate	ND	50	1.0	01/18/92
Phenol	ND	10	1.0	01/18/92
Aniline	ND	10	1.0	01/18/92
bis(2-chloroethyl) ether	ND	5.0	1.0	01/18/92
2-Chlorophenol	ND	10	1.0	01/18/92
1,3-Dichlorobenzene	ND	5.0	1.0	01/18/92
1,4-Dichlorobenzene	ND	5.0	1.0	01/18/92
Benzyl alcohol	ND	10	1.0	01/18/92
1,2-Dichlorobenzene	ND	5.0	1.0	01/18/92
2-Methylphenol	ND	10	1.0	01/18/92
bis(2chloroisopropyl)ether	ND	5.0	1.0	01/18/92
Acetophenone	ND	50	1.0	01/18/92
4-Methylphenol	ND	10	1.0	01/18/92
N-Nitroso-di-n-propylamine	ND	5.0	1.0	01/18/92
Hexachloroethane	ND	5.0	1.0	01/18/92
Nitrobenzene	ND	5.0	1.0	01/18/92
N-Nitrosopiperidine	ND	50	1.0	01/18/92
Isophorone	ND	5.0	1.0	01/18/92
2-Nitrophenol	ND	10	1.0	01/18/92
2,4-Dimethylphenol	ND	10	1.0	01/18/92
Benzoic acid	ND	50	1.0	01/18/92
bis(2-Chloroethoxy)methane	ND	10	1.0	01/18/92
a,a-Dimethylphenethylamine	ND	50	1.0	01/18/92
2,4-Dichlorophenol	ND	10	1.0	01/18/92
1,2,4-Trichlorobenzene	ND	5.0	1.0	01/18/92
Naphthalene	ND	5.0	1.0	01/18/92
2,6-Dichlorophenol	ND	50	1.0	01/18/92
4-Chloroaniline	ND	20	1.0	01/18/92
Hexachlorobutadiene	ND	5.0	1.0	01/18/92
N-Nitroso-di-n-butylamine	ND	50	1.0	01/18/92
4-Chloro-3-methylphenol	ND	10	1.0	01/18/92
2-Methylnaphthalene	ND	5.0	1.0	01/18/92
1,2,4,5-Tetrachlorobenzene	ND	50	1.0	01/18/92
Hexachlorocyclopentadiene	ND	5.0	1.0	01/18/92
2,4,6-Trichlorophenol	ND	10	1.0	01/18/92
2,4,5-Trichlorophenol	ND	10	1.0	01/18/92
2-Chloronaphthalene	ND	5.0	1.0	01/18/92
1-Chloronaphthalene	ND	50	1.0	01/18/92
2-Nitroaniline	ND	50	1.0	01/18/92
Dimethyl phthalate	ND	5.0	1.0	01/18/92
Acenaphthylene	ND	5.0	1.0	01/18/92
2,6-Dinitrotoluene	ND	5.0	1.0	01/18/92
3-Nitroaniline	ND	50	1.0	01/18/92
Acenaphthene	ND	5.0	1.0	01/18/92
2,4-Dinitrophenol	ND	50	1.0	01/18/92
4-Nitrophenol	ND	50	1.0	01/18/92
Dibenzofuran	ND	5.0	1.0	01/18/92

PLE ID OW-00-16 FRACTION 16A TEST CODE 625 NAME Semi-Volatiles in water
Date & Time Collected 01/16/92 Category

Pentachlorobenzene	ND	50	1.0	01/18/92
2,4-Dinitrotoluene	ND	5.0	1.0	01/18/92
1-Naphthylamine	ND	50	1.0	01/18/92
2-Naphthylamine	ND	50	1.0	01/18/92
2,3,4,6-Tetrachlorophenol	ND	50	1.0	01/18/92
Diethylphthalate	ND	5.0	1.0	01/18/92
4-Chlorophenyl-phenylether	ND	5.0	1.0	01/18/92
Fluorene	ND	5.0	1.0	01/18/92
4-Nitroaniline	ND	50	1.0	01/18/92
4,6-Dinitro-2-methylphenol	ND	50	1.0	01/18/92
Diphenylamine	ND	50	1.0	01/18/92
N-Nitrosodiphenylamine	ND	10	1.0	01/18/92
Azobenzene	ND	5.0	1.0	01/18/92
4-Bromophenyl-phenylether	ND	5.0	1.0	01/18/92
Phenacetin	ND	50	1.0	01/18/92
Hexachlorobenzene	ND	5.0	1.0	01/18/92
4-Aminobiphenyl	ND	50	1.0	01/18/92
Pentachlorophenol	ND	30	1.0	01/18/92
Pronamide	ND	50	1.0	01/18/92
Phenanthrene	ND	5.0	1.0	01/18/92
Anthracene	ND	5.0	1.0	01/18/92
Di-n-butylphthalate	ND	5.0	1.0	01/18/92
Fluoranthene	ND	5.0	1.0	01/18/92
Benzidine	ND	50	1.0	01/18/92
Pyrene	ND	5.0	1.0	01/18/92
p-Dimethylaminoazobenzene	ND	50	1.0	01/18/92
Butylbenzylphthalate	ND	5.0	1.0	01/18/92
3,3'-Dichlorobenzidine	ND	20	1.0	01/18/92
Benzo(a)anthracene	ND	5.0	1.0	01/18/92
Chrysene	ND	5.0	1.0	01/18/92
bis(2-Ethylhexyl)phthalate	ND	5.0	1.0	01/18/92
Di-n-octyl phthalate	ND	5.0	1.0	01/18/92
7,12-Dimethylbenz(a)anthrace	ND	50	1.0	01/18/92
Benzo(b)fluoranthene	ND	5.0	1.0	01/18/92
Benzo(k)fluoranthene	ND	5.0	1.0	01/18/92
Benzo(a)pyrene	ND	5.0	1.0	01/18/92
3-Methylcholanthrene	ND	50	1.0	01/18/92
Dibenz(a,j)acridine	ND	50	1.0	01/18/92
Indeno(1,2,3-cd)pyrene	ND	5.0	1.0	01/18/92
Dibenzo(a,h)anthracene	ND	5.0	1.0	01/18/92
Benzo(g,h,i)perylene	ND	5.0	1.0	01/18/92

Notes and Definitions for this Report:

EXTRACTED 01/17/92
ANALYST TT
FILE ID >AE754
UNITS ug/L
BATCH_ID 625-76
COMMENTS

QC SUMMARY DATA SHEETS

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET
EPA METHOD 8240

b Sample No.: 011792BLANK

Client Sample No.: 011792BLANK

Ba Number: VOA1-92-010

Client: ETAL

ta File: >1V946

Matrix: WATER

ample wt/vol: 5.0 mL

Date Received: 00/00/00

Analyst: CORA

Date Analyzed: 01/17/92

lution Factor: 1.00000

CAS NO.	COMPOUND	CONCENTRATION UNITS: ug/L	Q
75-71-8	Dichlorodifluoromethane	20.	U
74-87-3	Chloromethane	10.	U
75-01-4	Vinyl Chloride	10.	U
74-83-9	Bromomethane	10.	U
75-00-3	Chloroethane	10.	U
75-69-4	Trichlorofluoromethane	10.	U
64-17-5	Ethanol	20.	U
75-35-4	1,1-Dichloroethene	3.	U
107-02-8	Acrolein	10.	U
67-64-1	Acetone	20.	U
74-88-4	Iodomethane	10.	U
75-15-0	Carbon Disulfide	5.	U
75-09-2	Methylene_Chloride	5.	U
156-60-5	trans-1,2-Dichloroethene	3.	U
107-13-1	Acrylonitrile	10.	U
75-34-3	1,1-Dichloroethane	3.	U
78-93-3	2-Butanone	20.	U
156-59-2	cis-1,2-Dichloroethene	3.	U
67-66-3	Chloroform	3.	U
107-06-2	1,2-Dichloroethane	3.	U
108-05-4	Vinyl Acetate	20.	U
71-55-6	1,1,1-Trichloroethane	3.	U
56-23-5	Carbon Tetrachloride	3.	U
71-43-2	Benzene	3.	U
79-01-6	Trichloroethene	3.	U
78-87-5	1,2-Dichloropropane	5.	U
75-27-4	Bromodichloromethane	3.	U
74-95-3	Dibromomethane	10.	U
110-75-8	2-Chloroethylvinyl_ether	10.	U
10061-01-5	cis-1,3-Dichloropropene	3.	U
10061-02-6	trans-1,3-Dichloropropene	5.	U
97-63-2	Ethyl Methacrylate	10.	U
79-00-5	1,1,2-Trichloroethane	5.	U

U = Compound undetected at the listed practical quantitation limit.
@ = Compound was found in sample. B = Compound was found in blank.

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET
EPA METHOD 8240

o Sample No.: 011792BLANK

Client Sample No.: 011792BLANK

Bat Number: VOA1-92-010

Client: ETAL

ta File: >1V946

Matrix: WATER

mple wt/vol: 5.0 mL

Date Received: 00/00/00

Analyst: CORA

Date Analyzed: 01/17/92

lution Factor: 1.00000

CAS NO.	COMPOUND	CONCENTRATION UNITS: ug/L	Q
124-48-1	Dibromochloromethane	3.	U
75-25-2	Bromoform	5.	U
108-10-1	4-Methyl-2-pentanone	20.	U
108-88-3	Toluene	3.	U
591-78-6	2-Hexanone	20.	U
79-34-5	1,1,2,2-Tetrachloroethane	3.	U
127-18-4	Tetrachloroethene	3.	U
108-90-7	Chlorobenzene	3.	U
100-41-4	Ethylbenzene	3.	U
95-47-6	Xylene (total)	3.	U
100-42-5	Styrene	3.	U
1476-11-5	cis-1,4-Dichloro-2-Butene	10.	U
96-18-4	1,2,3-Trichloropropane	10.	U
110-57-6	trans-1,4-Dichloro-2-Butene	10.	U

U = Compound undetected at the listed practical quantitation limit.
@ = Compound was found in sample. B = Compound was found in blank.

3A

LABORATORY CONTROL WATER SAMPLE SPIKE/SPIKE DUPLICATE RECOVERY

Lab Name:=== ETAL ===

Lab Sample No.: 011792BLANK

Date Analyzed: 01/17/92

Batch Number: VOA1-92-010

Analyst: CORA

NCR Number:

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC #	QC LIMITS REC.
1,1-Dichloroethene	50.00	0.00	43.00	86	61-145
Trichloroethene	50.00	0.00	46.00	92	71-120
Benzene	50.00	0.00	47.00	94	76-127
Toluene	50.00	0.00	49.00	97	76-125
Chlorobenzene	50.00	0.00	45.00	90	75-130

COMPOUND	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
1,1-Dichloroethene	50.00	39.00	78	9	14	61-145
Trichloroethene	50.00	49.00	98	6	14	71-120
Benzene	50.00	47.00	94	0	11	76-127
Toluene	50.00	53.00	106	8	13	76-125
Chlorobenzene	50.00	47.00	93	3	13	75-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of qc limits

RPD: 0 out of 5 outside limits
Spike Recovery: 0 out of 10 outside limits

COMMENTS: ______________________

2A
WATER VOLATILE SURROGATE RECOVERY

Lab Name:=== ETAL ===

Date Analyzed: 1/17/92 Batch Number: VOA1-92-010

Analyst: CORA NCR Number:

	EPA SAMPLE NO.	S1 (TOL) #	S2 (BFB) #	S3 (DCE) #	OTHER	TOT OUT
01	011792BLAN	109	105	97		0
02	LCS	100	103	95		0
03	01-040-01A	90	113	37 *		1
04	01-040-03A	102	99	82		0
05	01-040-05A	108	105	91		0
06	01-040-07A	103	103	92		0
07	01-040-09A	100	102	90		0
08	01-040-11A	108	111	97		0
09	01-040-13A	107	109	94		0
10	LCSD	105	110	107		0
11	01-040-01A	102	101	100	1:100	0
12	01-040-03A	107	105	104	1:100	0
13	01-040-05A	109	104	106	1:100	0
14	01-040-07A	104	103	100	1:100	0
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		QC LIMITS
S1 (TOL)	= Toluene-d8	(88-110)
S2 (BFB)	= Bromofluorobenzene	(86-115)
S3 (DCE)	= 1,2-Dichloroethane-d4	(76-114)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D Surrogates diluted out

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET
EPA METHOD 8240

b Sample No.: 011892BLANK
Client Sample No.: 011892BLANK

Bat Number: VOA1-92-011
Client: ETAL

Data File: >1V964
Matrix: WATER

mple wt/vol: 5.0 mL
Date Received: 00/00/00

Analyst: THIZAR
Date Analyzed: 01/18/92

lution Factor: 1.00000

CAS NO.	COMPOUND	CONCENTRATION UNITS: ug/L	Q
75-71-8	Dichlorodifluoromethane	20.	U
74-87-3	Chloromethane	10.	U
75-01-4	Vinyl Chloride	10.	U
74-83-9	Bromomethane	10.	U
75-00-3	Chloroethane	10.	U
75-69-4	Trichlorofluoromethane	10.	U
64-17-5	Ethanol	20.	U
75-35-4	1,1-Dichloroethene	3.	U
107-02-8	Acrolein	10.	U
67-64-1	Acetone	20.	U
74-88-4	Iodomethane	10.	U
75-15-0	Carbon Disulfide	5.	U
75-09-2	Methylene_Chloride	7.	@
156-60-5	trans-1,2-Dichloroethene	3.	U
107-13-1	Acrylonitrile	10.	U
75-34-3	1,1-Dichloroethane	3.	U
78-93-3	2-Butanone	20.	U
156-59-2	cis-1,2-Dichloroethene	3.	U
67-66-3	Chloroform	3.	U
107-06-2	1,2-Dichloroethane	3.	U
108-05-4	Vinyl Acetate	20.	U
71-55-6	1,1,1-Trichloroethane	3.	U
56-23-5	Carbon Tetrachloride	3.	U
71-43-2	Benzene	3.	U
79-01-6	Trichloroethene	3.	U
78-87-5	1,2-Dichloropropane	5.	U
75-27-4	Bromodichloromethane	3.	U
74-95-3	Dibromomethane	10.	U
110-75-8	2-Chloroethylvinyl_ether	10.	U
10061-01-5	cis-1,3-Dichloropropene	3.	U
10061-02-6	trans-1,3-Dichloropropene	5.	U
97-63-2	Ethyl Methacrylate	10.	U
79-00-5	1,1,2-Trichloroethane	5.	U

U = Compound undetected at the listed practical quantitation limit.
@ = Compound was found in sample. B = Compound was found in blank.

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET
EPA METHOD 8240

o Sample No.: 011892BLANK

Client Sample No.: 011892BLANK

Bat Number: VOA1-92-011

Client: ETAL

ta File: >1V964

Matrix: WATER

ample wt/vol: 5.0 mL

Date Received: 00/00/00

Analyst: THIZAR

Date Analyzed: 01/18/92

lution Factor: 1.00000

CAS NO.	COMPOUND	CONCENTRATION UNITS: ug/L	Q
124-48-1	Dibromochloromethane	3.	U
75-25-2	Bromoform	5.	U
108-10-1	4-Methyl-2-pentanone	20.	U
108-88-3	Toluene	3.	U
591-78-6	2-Hexanone	20.	U
79-34-5	1,1,2,2-Tetrachloroethane	3.	U
127-18-4	Tetrachloroethene	3.	U
108-90-7	Chlorobenzene	3.	U
100-41-4	Ethylbenzene	3.	U
95-47-6	Xylene (total)	3.	U
100-42-5	Styrene	3.	U
1476-11-5	cis-1,4-Dichloro-2-Butene	10.	U
96-18-4	1,2,3-Trichloropropane	10.	U
110-57-6	trans-1,4-Dichloro-2-Butene	10.	U

U = Compound undetected at the listed practical quantitation limit.
@ = Compound was found in sample. B = Compound was found in blank.

3A

LABORATORY CONTROL WATER SAMPLE SPIKE AND SPIKE DUPLICATE RECOVERY

Lab Name:=== ETAL === Lab Sample No.: 011892BLANK

Date Analyzed: 1/18/92 Batch Number: VOA1-92-011

Analyst: CORA NCR Number:

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC #	QC LIMITS REC.
1,1-Dichloroethene	50.00	0.00	39.00	78	61-145
Trichloroethene	50.00	0.00	52.00	103	71-120
Benzene	50.00	0.00	53.00	105	76-127
Toluene	50.00	0.00	57.00	113	76-125
Chlorobenzene	50.00	0.00	51.00	101	75-130

COMPOUND	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC #	% RPD #	QC LIMITS	
					RPD	REC.
1,1-Dichloroethene	50.00	40.00	79	1	14	61-145
Trichloroethene	50.00	47.00	94	9	14	71-120
Benzene	50.00	52.00	104	0	11	76-127
Toluene	50.00	56.00	112	0	13	76-125
Chlorobenzene	50.00	50.00	99	2	13	75-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of qc limits

RPD: 0 out of 5 outside limits
Spike Recovery: 0 out of 10 outside limits

COMMENTS: ______________________________

FORM III VOA-1 1/87 Rev.

2A

WATER VOLATILE SURROGATE RECOVERY

Lab Name:=== ETAL ===

Date Analyzed: 01/18/92 Batch Number: VOA1-92-011

Analyst: THIZAR NCR Number:

	EPA SAMPLE NO.	S1 (TOL) #	S2 (BFB) #	S3 (DCE) #	OTHER	TOT OUT
01	011892BLAN	104	104	94		0
02	LCS	106	103	92		0
03	LCSD	97	94	96		0
04	01-040-01A	99	100	97	10,000	0
05	01-040-15A	106	103	85	1:50	0
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		QC LIMITS
S1 (TOL)	= Toluene-d8	(88-110)
S2 (BFB)	= Bromofluorobenzene	(86-115)
S3 (DCE)	= 1,2-Dichloroethane-d4	(76-114)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D Surrogates diluted out

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET
EPA METHOD 8240

ab Sample No.: 011892BLANK

Client Sample No.: 011892BLANK

Ba h Number: VOA2-92-006

Client: ETAL

ata File: >2B910

Matrix: WATER

ample wt/vol: 5.0 mL

Date Received: 00/00/00

nalyst: CORA

Date Analyzed: 01/17/92

lution Factor: 1.00000

CAS NO.	COMPOUND	CONCENTRATION UNITS: ug/L	Q
75-71-8	Dichlorodifluoromethane	20.	U
74-87-3	Chloromethane	10.	U
75-01-4	Vinyl Chloride	10.	U
74-83-9	Bromomethane	10.	U
75-00-3	Chloroethane	10.	U
75-69-4	Trichlorofluoromethane	10.	U
64-17-5	Ethanol	20.	U
75-35-4	1,1-Dichloroethene	3.	U
107-02-8	Acrolein	10.	U
67-64-1	Acetone	20.	U
74-88-4	Iodomethane	10.	U
75-15-0	Carbon Disulfide	5.	U
75-09-2	Methylene_Chloride	5.	U
156-60-5	trans-1,2-Dichloroethene	3.	U
107-13-1	Acrylonitrile	10.	U
75-34-3	1,1-Dichloroethane	3.	U
78-93-3	2-Butanone	20.	U
156-59-2	cis-1,2-Dichloroethene	3.	U
67-66-3	Chloroform	3.	U
107-06-2	1,2-Dichloroethane	3.	U
108-05-4	Vinyl Acetate	20.	U
71-55-6	1,1,1-Trichloroethane	3.	U
56-23-5	Carbon Tetrachloride	3.	U
71-43-2	Benzene	3.	U
79-01-6	Trichloroethene	3.	U
78-87-5	1,2-Dichloropropane	5.	U
75-27-4	Bromodichloromethane	3.	U
74-95-3	Dibromomethane	10.	U
110-75-8	2-Chloroethylvinyl_ether	10.	U
10061-01-5	cis-1,3-Dichloropropene	3.	U
10061-02-6	trans-1,3-Dichloropropene	5.	U
97-63-2	Ethyl Methacrylate	10.	U
79-00-5	1,1,2-Trichloroethane	5.	U

U = Compound undetected at the listed practical quantitation limit.
@ = Compound was found in sample. B = Compound was found in blank.

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET
EPA METHOD 8240

Lab Sample No.: 011892BLANK Client Sample No.: 011892BLANK

Batch Number: VOA2-92-006 Client: ETAL

Data File: >2B910 Matrix: WATER

Sample wt/vol: 5.0 mL Date Received: 00/00/00

Analyst: CORA Date Analyzed: 01/17/92

Dilution Factor: 1.00000

CAS NO.	COMPOUND	CONCENTRATION UNITS: ug/L	Q
124-48-1	Dibromochloromethane	3.	U
75-25-2	Bromoform	5.	U
108-10-1	4-Methyl-2-pentanone	20.	U
108-88-3	Toluene	3.	U
591-78-6	2-Hexanone	20.	U
79-34-5	1,1,2,2-Tetrachloroethane	3.	U
127-18-4	Tetrachloroethene	3.	U
108-90-7	Chlorobenzene	3.	U
100-41-4	Ethylbenzene	3.	U
95-47-6	Xylene (total)	3.	U
100-42-5	Styrene	3.	U
1476-11-5	cis-1,4-Dichloro-2-Butene	10.	U
96-18-4	1,2,3-Trichloropropane	10.	U
110-57-6	trans-1,4-Dichloro-2-Butene	10.	U

U = Compound undetected at the listed practical quantitation limit.
@ = Compound was found in sample. B = Compound was found in blank.

3A

LABORATORY CONTROL WATER SAMPLE SPIKE/SPIKE DUPLICATE RECOVERY

Lab Name:=== ETAL === Lab Sample No.: 011892BLANK

Date Analyzed: 01/17/92 Batch Number: VOA2-92-006

Analyst: CORA NCR Number:

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC #	QC LIMITS REC.
1,1-Dichloroethene	50.00	0.00	41.00	82	61-145
Trichloroethene	50.00	0.00	48.00	95	71-120
Benzene	50.00	0.00	47.00	94	76-127
Toluene	50.00	0.00	47.00	94	76-125
Chlorobenzene	50.00	0.00	48.00	96	75-130

COMPOUND	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
1,1-Dichloroethene	50.00	44.00	88	7	14	61-145
Trichloroethene	50.00	46.00	91	4	14	71-120
Benzene	50.00	44.00	87	7	11	76-127
Toluene	50.00	45.00	90	4	13	76-125
Chlorobenzene	50.00	46.00	92	4	13	75-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of qc limits

RPD: 0 out of 5 outside limits
Spike Recovery: 0 out of 10 outside limits

COMMENTS: ______________________________

WATER VOLATILE SURROGATE RECOVERY

Lab Name:=== ETAL ===

Date Analyzed: 1/17/92 Batch Number: VOA2-92-006

Analyst: CORA NCR Number:

	EPA SAMPLE NO.	S1 (TOL) #	S2 (BFB) #	S3 (DCE) #	OTHER	TOT OUT
01	011892BLAN	96	87	106		0
02	LCS	99	89	103		0
03	LCSD	100	89	108		0
04	01-040-09A	99	89	113	1:100	0
05	01-040-11A	97	86	111	1:100	0
06	01-040-13A	96	87	112	1:100	0
07	01-040-15A	96	89	110	1:100	0
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		QC LIMITS
S1 (TOL)	= Toluene-d8	(88-110)
S2 (BFB)	= Bromofluorobenzene	(86-115)
S3 (DCE)	= 1,2-Dichloroethane-d4	(76-114)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D Surrogates diluted out

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
EPA METHOD 8270

Lab Sample No.: 01040-LMB | Client Sample No.: CONTROL SAMPLE
Batch Number: 625-76 | Client: SIMON-EEI
Data File: >AL748 | Matrix: WATER
Sample wt/vol: 1000 mL | Date Received: 01/16/91
Dilution Factor: 1.0 | Date Extracted: 01/17/92
Analyst: THIZAK | Date Analyzed: 01/18/92

CAS No.	COMPOUND	CONCENTRATION UNITS: ug/L	Q
62-75-9	N-Nitrosodimethylamine	10.	U
109-06-8	2-Picoline	50.	U
66-27-3	Methyl_methanesulfonate	50.	U
62-50-0	Ethyl methanesulfonate	50.	U
108-95-2	Phenol	10.	U
62-53-3	Aniline	10.	U
111-44-4	bis(2-Chloroethyl)Ether	5.	U
95-57-8	2-Chlorophenol	10.	U
541-73-1	1,3-Dichlorobenzene	5.	U
106-46-7	1,4-Dichlorobenzene	5.	U
100-51-6	Benzyl_alcohol	10.	U
95-50-1	1,2-Dichlorobenzene	5.	U
95-48-7	2-Methylphenol	10.	U
39638-32-9	bis(2-chloroisopropyl)ether	5.	U
98-86-2	Acetophenone	50.	U
106-44-5	4-Methylphenol	10.	U
621-64-7	N-Nitroso-Di-n-propylamine	5.	U
67-72-1	Hexachloroethane	5.	U
98-95-3	Nitrobenzene	5.	U
100-75-4	N-Nitrosopiperidine	50.	U
78-59-1	Isophorone	5.	U
88-75-5	2-Nitrophenol	10.	U
105-67-9	2,4-Dimethylphenol	10.	U
65-85-0	Benzoic_acid	50.	U
111-91-1	bis(2-Chloroethoxy)methane	10.	U
122-09-8	a,a-Dimethylphenethylamine	50.	U
120-83-2	2,4-Dichlorophenol	10.	U
120-82-1	1,2,4-Trichlorobenzene	5.	U
91-20-3	Naphthalene	5.	U
87-65-0	2,6-Dichlorophenol	50.	U
106-47-8	4-Chloroaniline	20.	U
87-68-3	Hexachlorobutadiene	5.	U
924-16-3	N-Nitroso-di-n-butylamine	50.	U
59-50-7	4-Chloro-3-methylphenol	10.	U
91-57-6	2-Methylnaphthalene	5.	U
95-94-3	1,2,4,5-Tetrachlorobenzene	50.	U
77-47-4	Hexachlorocyclopentadiene	5.	U
88-06-2	2,4,6-Trichlorophenol	10.	U

U = Compound undetected at the listed practical quantitation limit.
@ = Compound was found in sample. B = Compound was found in blank.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
EPA METHOD 8270

Lab Sample No.: 01040-LMB　　Client Sample No.: CONTROL SAMPLE

Batch Number: 025-70　　Client: SIMON-EEI

Data File: >HE748　　Matrix: WATER

Sample wt/vol: 1000 mL　　Date Received: 01/16/91

Dilution Factor: 1.0　　Date Extracted: 01/17/92

Analyst: THIZAR　　Date Analyzed: 01/18/92

CAS NO.	COMPOUND	CONCENTRATION UNITS: ug/L	Q
95-95-4	2,4,5-Trichlorophenol	10.	U
91-58-7	2-Chloronaphthalene	5.	U
90-13-1	1-Chloronaphthalene	50.	U
88-74-4	2-Nitroaniline	50.	U
131-11-3	Dimethylphthalate	5.	U
208-96-8	Acenaphthylene	5.	U
606-20-2	2,6-Dinitrotoluene	5.	U
99-09-2	3-Nitroaniline	50.	U
83-32-9	Acenaphthene	5.	U
51-28-5	2,4-Dinitrophenol	50.	U
100-02-7	4-Nitrophenol	50.	U
132-64-9	Dibenzofuran	5.	U
608-93-5	Pentachlorobenzene	50.	U
121-14-2	2,4-Dinitrotoluene	5.	U
134-32-7	1-Naphthylamine	50.	U
91-59-8	2-Naphthylamine	50.	U
58-90-2	2,3,4,6-Tetrachlorophenol	50.	U
84-66-2	Diethylphthalate	5.	U
7005-72-3	4-Chlorophenyl-phenylether	5.	U
86-73-7	Fluorene	5.	U
100-01-6	4-Nitroaniline	50.	U
534-52-1	4,6-Dinitro-2-methylphenol	50.	U
122-39-4	Diphenylamine	50.	U
86-30-6	N-Nitrosodiphenylamine	10.	U
103-33-3	Azobenzene	5.	U
101-55-3	4-Bromophenyl-phenylether	5.	U
62-44-2	Phenacetin	50.	U
118-74-1	Hexachlorobenzene	5.	U
92-67-1	4-Aminobiphenyl	50.	U
87-86-5	Pentachlorophenol	30.	U
23950-58-5	Pronamide	50.	U
85-01-8	Phenanthrene	5.	U
120-12-7	Anthracene	5.	U
84-74-2	Di-n-butylphthalate	5.	U
206-44-0	Fluoranthene	5.	U
92-87-5	Benzidine	50.	U
129-00-0	Pyrene	5.	U
60-11-7	p-Dimethylaminoazobenzene	50.	U

U = Compound undetected at the listed practical quantitation limit.
Q = Compound was found in sample. B = Compound was found in blank.

EPA METHOD 8270

Lab Sample No.: 01040-LAB

Client Sample No.: CONTROL SAMPLE

Batch Number: 025-76

Client: SIMON-EEI

Data File: >AE748

Matrix: WATER

Sample wt/vol: 1000 mL

Date Received: 01/16/91

Dilution Factor: 1.0

Date Extracted: 01/17/92

Analyst: THIZAR

Date Analyzed: 01/18/92

CAS NO.	COMPOUND	CONCENTRATION UNITS: ug/L	Q
85-68-7	Butylbenzylphthalate	5.	U
91-94-1	3,3'-Dichlorobenzidine	20.	U
56-55-3	Benzo(a)anthracene	5.	U
218-01-9	Chrysene	5.	U
117-81-7	bis(2-Ethylhexyl)phthalate	5.	U
117-84-0	Di-n-octylphthalate	5.	U
57-97-6	7,12-Dimethylbenz(a)anthrac	50.	U
205-99-2	Benzo(b)fluoranthene	5.	U
207-08-9	Benzo(k)fluoranthene	5.	U
50-32-8	Benzo(a)pyrene	5.	U
56-49-5	3-Methylcholanthrene	50.	U
224-42-0	Dibenz(a,j)acridine	50.	U
193-39-5	Indeno(1,2,3-cd)pyrene	5.	U
53-70-3	Dibenzo(a,h)anthracene	5.	U
191-24-2	Benzo(g,h,i)perylene	5.	U

U = Compound undetected at the listed practical quantitation limit.
Q = Compound was found in sample. B = Compound was found in blank.

LABORATORY CONTROL WATER SAMPLE SPIKE AND SPIKE DUPLICATE RECOVERY

Lab Name:ETAL | Lab Sample No. 01040-LMB

Date Analyzed: 01/18/92 | Batch Number: 625-76

Analyst: THIZAR | NCR Number:

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC #	QC LIMITS REC.
Phenol	100.00	0.00	33.00	32	12-110
2-Chlorophenol	100.00	0.00	71.00	71	27-123
1,4-Dichlorobenzene	50.00	0.00	38.00	75	36- 97
N-Nitroso-di-n-prop.(1)	50.00	0.00	50.00	99	41-116
1,2,4-Trichlorobenzene	50.00	0.00	32.00	64	39- 98
4-Chloro-3-methylphenol	100.00	0.00	60.00	59	23- 97
Acenaphthene	50.00	0.00	40.00	80	46-118
4-Nitrophenol	100.00	0.00	25.00	24	10- 80
2,4-Dinitrotoluene	50.00	0.00	40.00	79	24- 96
Pentachlorophenol	100.00	0.00	49.00	49	9-103
Pyrene	50.00	0.00	41.00	82	26-127

COMPOUND	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Phenol	100.00	29.00	28	13	42	12-110
2-Chlorophenol	100.00	54.00	53	29	40	27-123
1,4-Dichlorobenzene	50.00	29.00	57	27	28	36- 97
N-Nitroso-di-n-prop.(1)	50.00	38.00	76	26	38	41-116
1,2,4-Trichlorobenzene	50.00	30.00	59	8	28	39- 98
4-Chloro-3-methylphenol	100.00	62.00	62	4	42	23- 97
Acenaphthene	50.00	41.00	81	1	31	46-118
4-Nitrophenol	100.00	26.00	26	8	50	10- 80
2,4-Dinitrotoluene	50.00	35.00	69	13	38	24- 96
Pentachlorophenol	100.00	51.00	50	2	50	9-103
Pyrene	50.00	34.00	68	18	31	26-127

(1) N-Nitroso-di-n-propylamine

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of qc limits

RPD: 0 out of 11 outside limits
Spike Recovery: 0 out of 22 outside limits

COMMENTS: ____________________

Lab Name: ETAL

Date Analyzed: 1/18/92 Batch Number: 625-76

Analyst: THIZAR NCR Number:

	EPA SAMPLE NO.	S1 (NBZ)#	S2 (FBP)#	S3 (TPH)#	S4 (PHL)#	S5 (2FP)#	S6 (TBP)#	OTHER	TOT OUT
01	01040-LMB	65	90	76	58	48	82		0
02	01040-LCS	67	94	84	39	52	80		0
03	01040-LCSD	68	81	75	30	40	67		0
04	01040-04A	76	102	80	44	52	78		0
05	01040-06A	61	90	79	45	51	81		0
06	01040-08A	66	90	73	47	56	81		0
07	01040-10A	59	91	67	41	48	78		0
08	01040-14A	62	75	70	42	49	89		0
09	01040-16A	57	79	77	37	45	80		0
10	01040-02A	1 *	93	72	23	6 *	18		2
11	01040-12A	58	80	57	38	45	76		0
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									
26									
27									
28									
29									
30									

		QC LIMITS
S1 (NBZ)	= Nitrobenzene-d5	(35-114)
S2 (FBP)	= 2-Fluorobiphenyl	(43-116)
S3 (TPH)	= Terphenyl-d14	(33-141)
S4 (PHL)	= Phenol-d5	(10-110)
S5 (2FP)	= 2-Fluorophenol	(21-110)
S6 (TBP)	= 2,4,6-Tribromophenol	(10-123)

Column to be used to flag recovery values
* Values outside of contract required QC limits
D Surrogates diluted out

CHAIN OF CUSTODY AND ANALYSIS REQUEST

Project Name/No. 512-345

Project Location TORRANCE

Samplers' Name GALVIN F. LEE

Signature Galvin F. Lee

Laboratory

SIMON - EEI

714-891-7446

SAMPLE ID	DATE	TIME	SAMPLE LOCATION, MEDIA, TYPE, DESCRIPTION	ANALYSIS REQUESTED: 624	625	Number of Containers	Remarks
OW-01-01	1-16-92	1250		X		2	SEND ANALYSES TO: LEO CHAIDEZ
OW-01-02		1250			X	1	AT ADDRESS LISTED ABOVE
OW-02-03		1402		X		2	
OW-02-04		1402			X	1	
OW-100-05		1410		X		2	
OW-100-06		1410			X	1	
OW-03-07		1519		X		2	
OW-03-08		1519			X	1	
OW-04-09		1510		X		2	
OW-04-10		1510			X	1	
OW-05-11		1615		X		2	
OW-05-12		1615			X	1	
OW-06-13		1625		X		2	
OW-06-14		1625			X	1	
OW-00-15	1-16-92	1620		X		2	
			Total Number of Containers:				

Relinquished by:	Date/Time	Received by:	Relinquished by:	Date/Time	Received by:
Galvin F. Lee	1-16-92 1745				GREG WRANIC

Relinquished by:	Date/Time	Received by:	Relinquished by:	Date/Time	Received for Lab by:
					Greg Wranic GREG WRANIC

Method of Shipment to Laboratory: Agent Person Shipping:

Distribution: Laboratory should sign and return WHITE COPY with analyses. YELLOW, sampler retains.

CHAIN OF CUSTODY AND ANALYSIS REQUEST

01.040

SIMON-EEI

Project Name/No. 512-345

Project Location TORRANCE

Samplers' Name CALVIN F. LEE

Signature Calvin F. Lee

Laboratory

ANALYSIS REQUESTED

SIMON - EEI

714-891-7446

SAMPLE ID	DATE	TIME	SAMPLE LOCATION, MEDIA, TYPE, DESCRIPTION		625										Number of Containers	Remarks
W-00-16	1-16-92	1620			X										1	SEND ANALYSES TO: LEO CHAIDEZ
																AT ADDRESS LISTED ABOVE

Total Number of Containers:

Relinquished by:	Date/Time	Received by:	Relinquished by:	Date/Time	Received by:
Calvin F. Lee	1-16-92 1745				GREG WEANC

Relinquished by:	Date/Time	Received by:	Relinquished by:	Date/Time	Received for Lab by:
					Greg W. 1-16-92

Method of Shipment to Laboratory: Agent Person Shipping:

Distribution: Laboratory should sign and return WHITE COPY with analyses. YELLOW, sampler retains.

APPENDIX B

GROUNDWATER MONITORING WELL SAMPLING PROTOCOL

APPENDIX B

MONITORING WELL SAMPLING PROTOCOL

Sampling was conducted using disposable polyethylene bailers having controlled flow emptying devices. Samples were collected in clean 40-milliliter glass vials having lids with Teflon lined septa and containing hydrochloric acid as a preservative.

Subsequent to collection, each vial was visually checked to ensure no air was entrapped within the vial. A sample label was then affixed to each vial and contained the following information: date, job number, well number, sample number, collectors initials and requested analysis. A custody seal was placed across each container lid to ensure sample integrity prior to analysis. Sealed and labeled sample containers were placed immediately into an ice chest containing blue ice for transport to the analytical laboratory at the end of the field day. Chain-of-custody forms were completed in the field and accompanied the samples to the analytical laboratory.

simon

Environmental
Engineering

[redacted]

0639-2336

REPORT OF GROUNDWATER SAMPLING AND ANALYSIS
AMOCO CHEMICAL COMPANY
TORRANCE, CALIFORNIA

simon-EEI

0639-0233C

REPORT OF GROUNDWATER SAMPLING AND ANALYSIS
AMOCO CHEMICAL COMPANY
TORRANCE, CALIFORNIA

SIMON
Environmental
Engineering

SIMON-EEI Inc.
6695 E. Pacific Coast Hwy
Long Beach, CA 90803

Telephone (213) 430-6500
Fax (213) 430-1271

January 21, 1991

Amoco Chemical Company
1225 West 196th Street
Torrance, California 90502

Attention: Mr. Robert Dorr
Environmental Coordinator

Subject: Report of Groundwater Sampling and Analysis
Amoco Chemical Facility
1225 West 196th Street
Torrance, California
Project No. 512-345

Dear Mr. Dorr:

Presented herewith is the report of groundwater sampling performed by Simon-EEI Inc. This assessment was performed at the request of Amoco, Inc. to monitor the concentration volatile and semi-volatile organic compounds in six groundwater monitoring wells at the subject site.

We trust this report meets your current requirements. Should you have questions regarding the results contained herein, or require further clarification, please contact us. We appreciate the opportunity to be of continued service to Amoco.

Respectfully,

William E. Halbert
Project Hydrogeologist

REPORT OF GROUNDWATER SAMPLING AND ANALYSIS

AMOCO CHEMICAL COMPANY

TORRANCE, CALIFORNIA

Prepared for:

Amoco Chemical Company
1225 West 196th Street
Torrance, California 90502

Submitted by:

Simon-EEI Inc.
6695 East Pacific Coast Highway
Long Beach, California 90803
213/430-6500

William E. Halbert
Project Hydrogeologist

for

N. Mark Reese
Regional Manager
Southern California

REPORT OF GROUNDWATER SAMPLING AND ANALYSIS
AMOCO CHEMICAL COMPANY
TORRANCE, CALIFORNIA

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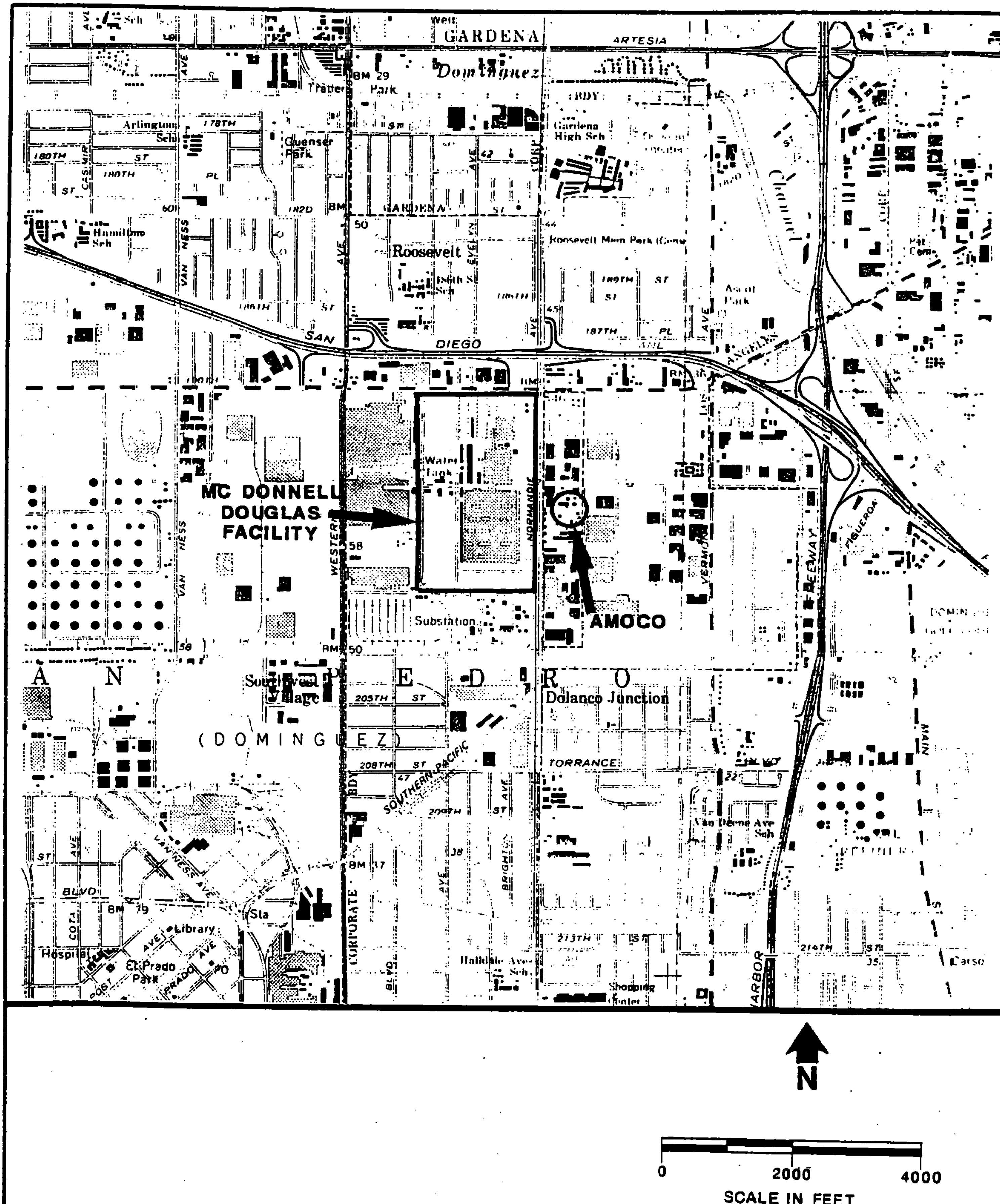
REPORT OF GROUNDWATER SAMPLING AND ANALYSIS
AMOCO CHEMICAL COMPANY
TORRANCE, CALIFORNIA

1.0 INTRODUCTION

Amoco Chemical Company operates a facility at 1225 West 196th Street, Torrance, California for the conversion of styrene monomer to styrene polymer (Figure 1). Initial groundwater samples were obtained from the six groundwater monitoring wells located onsite in early 1989 and analyzed by Amoco's laboratory in Joliet, Illinois. Results reported verbally by Amoco to Engineering Enterprises, Inc. indicated no organic compounds were detected. Simon-EEI was again requested by Amoco to collect groundwater samples from the wells in February, 1990. Results from this event indicated the presence of volatile organic compounds in all wells. Confirmation sampling and analysis was conducted three weeks after previous event with samples sent to two independent laboratories. Reported results verified the previously reported concentrations. Amoco requested Simon-EEI to conduct groundwater sampling and analysis in December, 1990. This report contains the results of that groundwater sampling event performed by Simon.

2.0 PURPOSE

The purpose of the groundwater sampling was to evaluate the concentration of volatile and semi-volatile organic compounds in groundwater samples collected from onsite monitoring wells.



SITE LOCATION MAP
AMOCO CHEMICAL FACILITY
TORRANCE, CALIFORNIA

SIMON-EEI Inc.

PROJECT NO: 512-345

DATE: DECEMBER, 1990

FIGURE: 1

3.0 SCOPE OF WORK

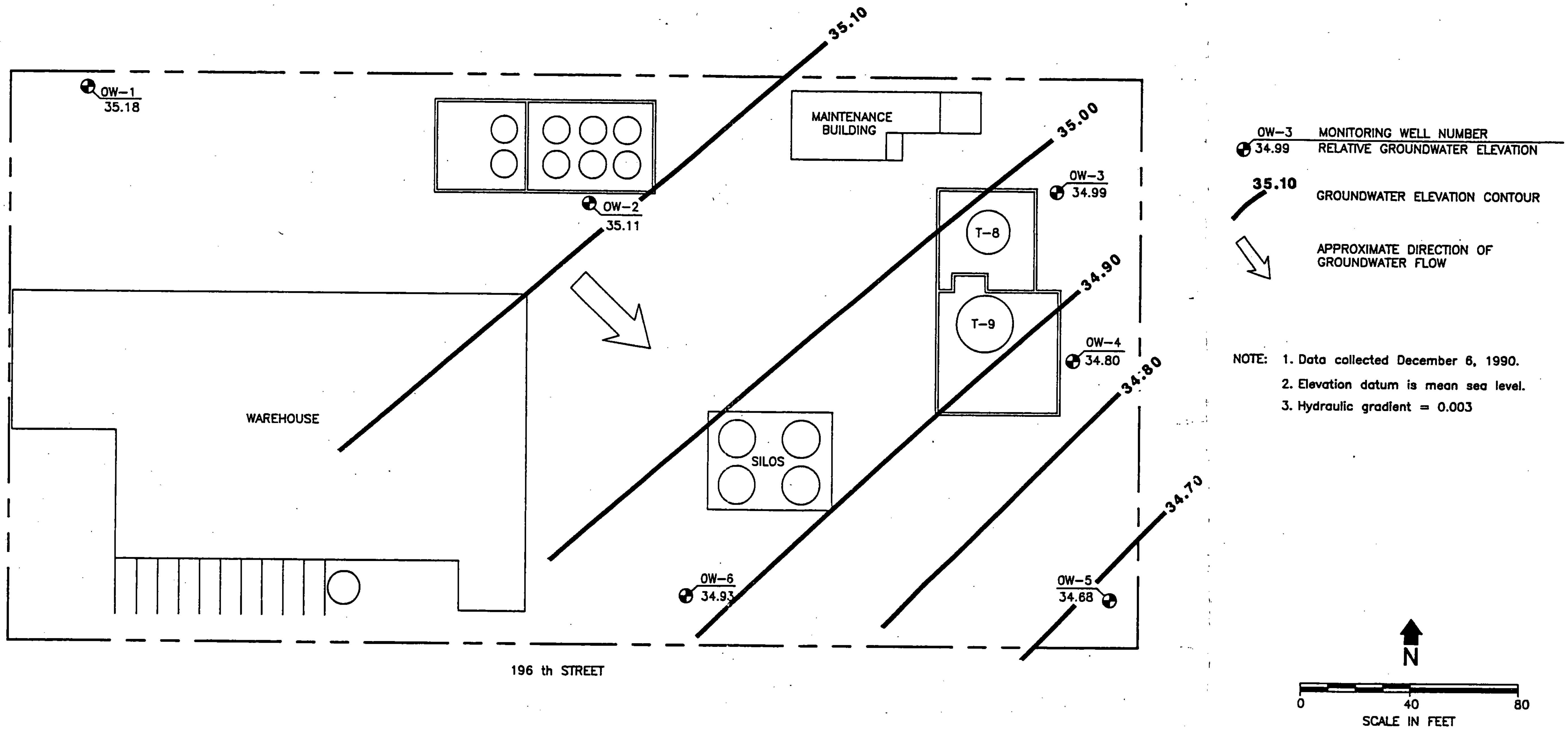
To achieve the purpose stated above, the following scope of work was performed:

- Groundwater samples from the six onsite groundwater monitoring wells were collected in accordance with SW846 and EPA protocol;
- Groundwater samples were chemically analyzed using EPA methods 8240 and 8270 for volatile and semi-volatile organic compounds, respectively; and,
- This report was prepared to present analytical data and concentration trends over time.

4.0 GROUNDWATER SAMPLING METHODOLOGY

Groundwater sampling was conducted on the six groundwater monitoring wells located onsite (Figure 2). Prior to sampling, wells were gauged to identify depth of water, depth of well and volume of water within the well bore. Wells were then purged of at least five well volumes of water using a Teflon bailer. Measurements of temperature, electrical conductivity and pH were taken during the purging process. When five well volumes of water had been purged and three consecutive readings had stabilized to within ten percent of one another, groundwater samples were collected for laboratory analysis.

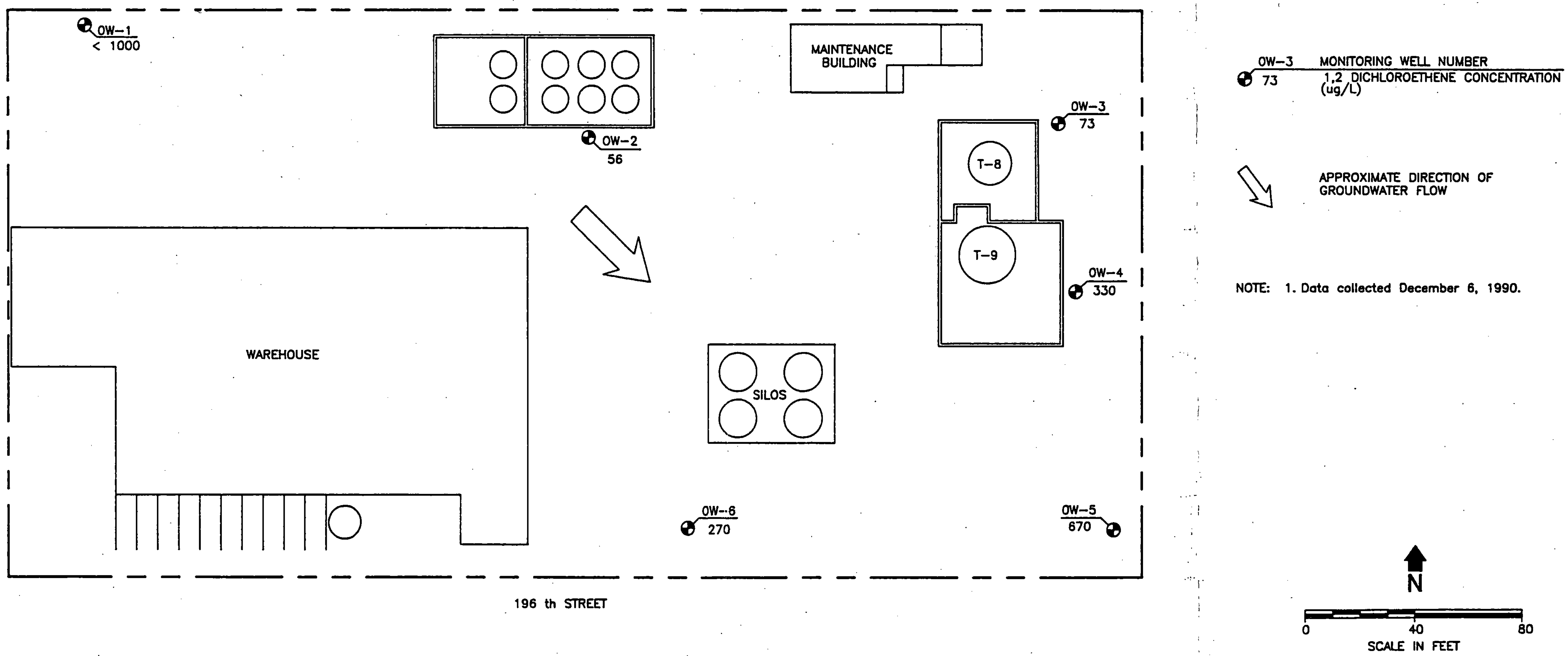
Groundwater samples were collected using disposable polyethylene bailers fitted with controlled flow emptying devices. Samples were collected into laboratory clean glass vials having lids with Teflon



GROUNDWATER ELEVATION CONTOUR MAP
1225 WEST 196th STREET
TORRANCE, CALIFORNIA

simon-EEI Inc.

PROJECT NO: 512-345	FIGURE: 2
DATE: DECEMBER, 1990	



NOTE: 1. Data collected December 6, 1990.

1,2 DICHLOROETHENE CONCENTRATION MAP
1225 WEST 196th STREET
TORRANCE, CALIFORNIA

SIMON-EEI Inc.

PROJECT NO: 512-345	FIGURE: 3
DATE: DECEMBER, 1990	

lined septa and containing hydrochloric acid as a preservative. Samples were transferred from the bailer to the vials using the submerged fill technique. Lids were replaced on the vials and the vials inverted and visually checked for the presence of entrapped air. Samples containing air were uncapped, refilled and rechecked. Samples not containing air had labels affixed which contained the following information: date, samplers initials, job number, well number, sample number and requested analyses. Appropriately sealed and labeled samples were then placed in an ice chest containing frozen blue-ice for transport to the analytical laboratory. A field blank was collected by pouring distilled water into a clean bailer and then decanting the water into sample vials. A blind duplicate sample was collected from well OW-4 and submitted to the laboratory as sample number W-22. Chain-of-custody forms were completed in the field and accompanied the samples to the laboratory. Bailers were discarded after use.

5.0 LABORATORY ANALYSIS

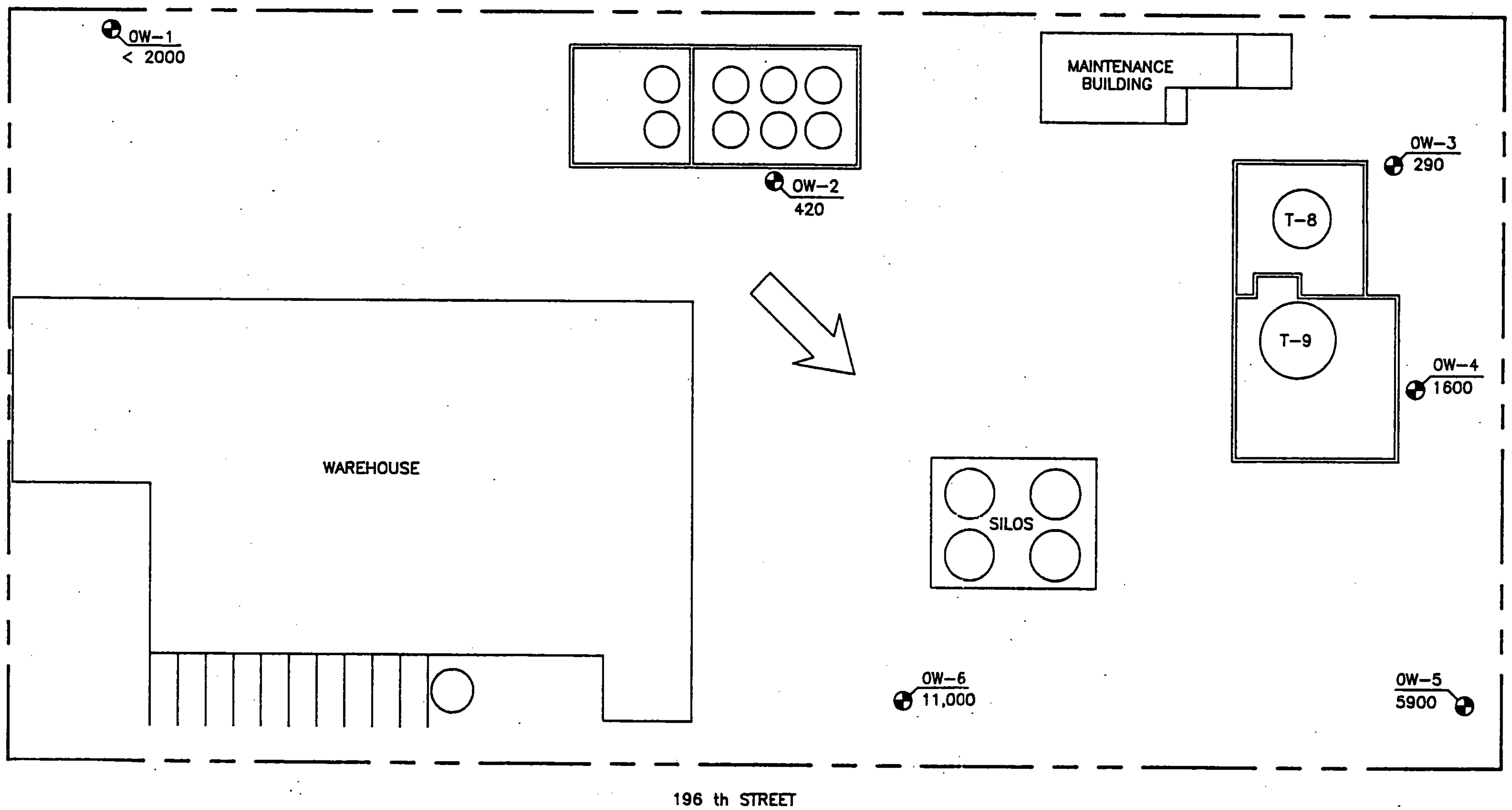
Groundwater samples were analyzed using EPA methods 8240 and 8270 for volatile and semi-volatile organic compounds, respectively. Laboratory reports and chain-of-custody forms are included in Appendix A.

6.0 DISCUSSION OF RESULTS

Groundwater beneath the site occurs under water table conditions at an approximate depth of 75 feet below ground surface, or at an elevation of approximately 35 feet above mean sea level, with a gradient of 0.003 feet per foot to the southeast. Monitoring well hydrographs are included in Appendix B.

All groundwater samples contained detectable concentrations of volatile organic compounds. None of the groundwater samples contained detectable concentrations of semi-volatile organic compounds. The field blank sample contained a reported concentration of 72 micrograms per liter (ug/L) of Di-N-octyl phthalate, a plasticizer. This compound was not detected in any groundwater samples and may therefore, be attributed to either the polyethylene bailer or plastic bottle in which the distilled water was contained.

Maps showing detected concentrations of three organic compounds, 1,2 dichloroethene, trichloroethylene and tetrachloroethylene are presented in Figures 3-5, respectively. Table 1 contains reported concentrations of detected compounds by well number. Graphs of detected volatile compound concentrations over time are contained in Appendix C.



OW-3 MONITORING WELL NUMBER
290 TETRACHLOROETHYLENE CONCENTRATION (ug/L)

APPROXIMATE DIRECTION OF GROUNDWATER FLOW

NOTE: 1. Data collected December 6, 1990.

N

0 40 80
SCALE IN FEET

TETRACHLOROETHYLENE CONCENTRARION MAP
1225 WEST 196th STREET
TORRANCE, CALIFORNIA

SIMON-EEI Inc.

PROJECT NO: 512-345	FIGURE: 5	
DATE: DECEMBER, 1990		

TABLE 1
Dec 1990
REPORTED ANALYTICAL RESULTS OF SELECTED COMPOUNDS

	OW-00 (Field Blank)	2/1/90	2/21/90	OW-1			OW-2			OW-3			OW-4	OW-22 (a)			OW-5			OW-6
Methylene Chloride	<5(b)	10,000	190,000	320,000	ND20	<25	<50	ND75	<100	<100	ND56	<75	<200	<125	ND20	<500	<500	ND75	<200	<500
1,1 Dichloroethene	<1	ND 80	< 1500	<1000	ND4	<5	<10	NC15	35	<20	17	<15	46	64	63	100-130	<100	21	56	<100
1,2 Dichloroethene	<1	ND80	< 1500	<1000	ND64	6	56	54	150	73	64	87	330	330	200	380	670	21	59	270
Trichloroethylene TCE	<1	1000	2,200	2000	500-625	1100	3000		3800	2600		3400	7200	7200		15-10,000	21000		7,800	27000
Tetrachloroethylene PCE	<1	ND80	<1500	<2000		160	420		1100	290		4100	1600	1600		51-5900	8100		3300	11000
Chloroform	<1			<1000	50-68		25			<20			<40	<25			<100			<100
Semi-Volatile Organic Compounds	Di-N-Octyl-phthalate 72			Butanoic Acid 200 Carboxylic Acid 150			Cyclic Hydrocarbon 50			ND(c)			ND	ND			ND			ND

(a) Duplicate of OW-4
(b) <5 = Not detected above 5 ug/L
(c) ND = None detected

ND 1500 ND5 ND20 ND15 ND 80 210

Xylenes ND5 ND20 ND15 ND100 2800

Ethylbenzene ND 1500

7.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the analytical results presented above, the following conclusions are made:

- o Groundwater at the site occurs under water table conditions at a depth of 63 to 66 feet below ground surface with a flow direction to the southeast having a gradient of approximately 0.003.
- o Groundwater at the site contains detectable concentrations of purgeable compounds specifically methylene chloride, 1,1- and 1,2-dichloroethene, TCE, PCE, and chloroform.
- o No semi volatile compounds were detected in collected groundwater samples above reported detection limits. Butanoic acid and carboxylic acid were detected in well OW-1. A cyclic hydrocarbon was detected in well OW-2.
- o Concentrations of the above chemicals appear to increase in a downgradient direction.

8.0 LIMITATIONS

The conclusions and recommendations presented above are based upon:

- o Observations and measurements collected during the sampling of six groundwater monitoring wells;
- o Results of laboratory analyses conducted on groundwater samples by Analytical Technologies, Inc. of San Diego, California;

It is possible that variations in groundwater conditions exist beyond the points explored in this assessment. Also, changes in groundwater conditions may occur at some future time due to fluctuations in rainfall, regional water uses, or other factors, which would alter chemical conditions presented above.

Simon-EEI Inc. warrants services provided in conjunction with this assessment were performed in a manner consistent with that level of care and skill ordinarily exercised by members of our profession currently practicing in the Los Angeles County area. No other warranty, express or implied, is made.

APPENDIX A

LABORATORY REPORTS AND CHAIN-OF-CUSTODY FORMS

Analytical**Technologies,** Inc. Corporate Offices: 5550 Morehouse Drive San Diego, CA 92121 (619) 458-9141

ATI I.D. 012070

Janaury 3, 1991

Simon-EEI, Inc.
6695 E. Pacific Coast Highway
Long Beach, CA 90803

Project No.: 512-345

Attention: Bill Halbert

On December 6, 1990, Analytical Technologies, Inc. received eight water samples for analyses. The samples were analyzed with EPA methodology or equivalent methods as specified in the attached analytical schedule. The symbol for "less than" indicates a value below the reportable detection limit. Please see the attached sheet for the sample cross reference.

The results of these analyses and the quality control data are enclosed.

T J Fitzpatrick
Timothy J. Fitzpatrick
Senior Project Manager

TJF:da

CASites
for: Richard M. Amano
Laboratory Manager

Analytical Technologies, Inc.

ATI I.D. 012070

ANALYTICAL SCHEDULE

CLIENT: SIMON-EEI, INC.
PROJECT NAME: (NONE)

PROJECT NO.: 512-345

ANALYSIS	TECHNIQUE	REFERENCE/METHOD
VOLATILE ORGANICS	GC/MS	EPA 8240
SEMI-VOLATILE ORGANICS (BNA)	GC/MS	EPA 8270

AnalyticalTechnologies,Inc.

CLIENT : SIMON-EEI INC.
PROJECT # : 512-345
PROJECT NAME : (NONE)

DATE RECEIVED : 12/06/90

REPORT DATE : 01/03/91

ATI I.D. : 012070

ATI #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	W-00	WATER	12/05/90
02	W-01	WATER	12/05/90
03	W-02	WATER	12/05/90
04	W-03	WATER	12/05/90
05	W-04	WATER	12/05/90
06	W-05	WATER	12/05/90
07	W-06	WATER	12/05/90
08	W-22	WATER	12/05/90

----- TOTALS -----

MATRIX	# SAMPLES
WATER	8

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in twenty-one (21) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.

AnalyticalTechnologies,Inc.

GCMS - RESULTS

ATI I.D. : 01207001

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

CLIENT	: SIMON-EEI INC.	DATE SAMPLED	: 12/05/90
PROJECT #	: 512-345	DATE RECEIVED	: 12/06/90
PROJECT NAME	: (NONE)	DATE EXTRACTED	: N/A
CLIENT I.D.	: W-00	DATE ANALYZED	: 12/15/90
SAMPLE MATRIX	: WATER	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROMETHANE	<10
BROMOMETHANE	<10
VINYL CHLORIDE	<1
CHLOROETHANE	<1
METHYLENE CHLORIDE	<5
ACETONE	<20
CARBON DISULFIDE	<1
1,1-DICHLOROETHENE	<1
1,1-DICHLOROETHANE	<1
1,2-DICHLOROETHENE (TOTAL)	<1
CHLOROFORM	<1
1,2-DICHLOROETHANE	<1
2-BUTANONE (MEK)	<20
1,1,1-TRICHLOROETHANE	<1
CARBON TETRACHLORIDE	<1
VINYL ACETATE	<10
BROMODICHLOROMETHANE	<1
1,1,2,2-TETRACHLOROETHANE	<1
1,2-DICHLOROPROPANE	<1
CIS-1,3-DICHLOROPROPENE	<1
TRICHLOROETHENE	<1
DIBROMOCHLOROMETHANE	<1
1,1,2 TRICHLOROETHANE	<1
BENZENE	<1
TRANS-1,3-DICHLOROPROPENE	<1
BROMOFORM	<5
2-HEXANONE (MBK)	<10
4-METHYL-2-PENTANONE (MIBK)	<10
TETRACHLOROETHENE	<1
TOLUENE	<2
CHLOROBENZENE	<1
ETHYL BENZENE	<1
STYRENE	<1
TOTAL XYLENES	<1

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	110
BFB (%)	107
TOLUENE-D8 (%)	97

Analytical Technologies, Inc. ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

ATI I.D. : 01207001

MATRIX : WATER

UNITS : UG/L

COMPOUNDS	RESULTS
NONE DETECTED	N/A

Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 01207002

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

CLIENT : SIMON-EEI INC.
PROJECT # : 512-345
PROJECT NAME : (NONE)
CLIENT I.D. : W-01
SAMPLE MATRIX : WATER

DATE SAMPLED : 12/05/90
DATE RECEIVED : 12/06/90
DATE EXTRACTED : N/A
DATE ANALYZED : 12/16/90
UNITS : UG/L
DILUTION FACTOR : 1000

COMPOUNDS	RESULTS
CHLOROMETHANE	<10000
BROMOMETHANE	<10000
VINYL CHLORIDE	<1000
CHLOROETHANE	<1000
METHYLENE CHLORIDE	320000
ACETONE	<20000
CARBON DISULFIDE	<1000
1,1-DICHLOROETHENE	<1000
1,1-DICHLOROETHANE	<1000
1,2-DICHLOROETHENE (TOTAL)	<1000
CHLOROFORM	<1000
1,2-DICHLOROETHANE	<1000
2-BUTANONE (MEK)	<20000
1,1,1-TRICHLOROETHANE	<1000
CARBON TETRACHLORIDE	<1000
VINYL ACETATE	<10000
BROMODICHLOROMETHANE	<1000
1,1,2,2-TETRACHLOROETHANE	<1000
1,2-DICHLOROPROPANE	<1000
CIS-1,3-DICHLOROPROPENE	<1000
TRICHLOROETHENE	2000
DIBROMOCHLOROMETHANE	<1000
1,1,2 TRICHLOROETHANE	<1000
BENZENE	<1000
TRANS-1,3-DICHLOROPROPENE	<1000
BROMOFORM	<5000
2-HEXANONE (MBK)	<10000
4-METHYL-2-PENTANONE (MIBK)	<10000
TETRACHLOROETHENE	<1000
TOLUENE	<2000
CHLOROBENZENE	<1000
ETHYL BENZENE	<1000
STYRENE	<1000
TOTAL XYLENES	<1000

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	110
BFB (%)	110
TOLUENE-D8 (%)	99

Analytical Technologies, Inc.

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

ATI I.D. : 01207002

MATRIX : WATER

UNITS : UG/L

COMPOUNDS	RESULTS
NONE DETECTED	N/A

AnalyticalTechnologies,Inc.

GCMS - RESULTS

ATI I.D. : 01207003

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

CLIENT	: SIMON-EEI INC.	DATE SAMPLED	: 12/05/90
PROJECT #	: 512-345	DATE RECEIVED	: 12/06/90
PROJECT NAME	: (NONE)	DATE EXTRACTED	: N/A
CLIENT I.D.	: W-02	DATE ANALYZED	: 12/16/90
SAMPLE MATRIX	: WATER	UNITS	: UG/L
		DILUTION FACTOR	: 10

COMPOUNDS	RESULTS
CHLOROMETHANE	<100
BROMOMETHANE	<100
VINYL CHLORIDE	<10
CHLOROETHANE	<10
METHYLENE CHLORIDE	<50
ACETONE	<200
CARBON DISULFIDE	<10
1,1-DICHLOROETHENE	<10
1,1-DICHLOROETHANE	<10
1,2-DICHLOROETHENE (TOTAL)	56
CHLOROFORM	25
1,2-DICHLOROETHANE	<10
2-BUTANONE (MEK)	<200
1,1,1-TRICHLOROETHANE	<10
CARBON TETRACHLORIDE	<10
VINYL ACETATE	<100
BROMODICHLOROMETHANE	<10
1,1,2,2-TETRACHLOROETHANE	<10
1,2-DICHLOROPROPANE	<10
CIS-1,3-DICHLOROPROPENE	<10
TRICHLOROETHENE	3000
DIBROMOCHLOROMETHANE	<10
1,1,2 TRICHLOROETHANE	<10
BENZENE	<10
TRANS-1,3-DICHLOROPROPENE	<10
BROMOFORM	<50
2-HEXANONE (MBK)	<100
4-METHYL-2-PENTANONE (MIBK)	<100
TETRACHLOROETHENE	420
TOLUENE	<20
CHLOROBENZENE	<10
ETHYL BENZENE	<10
STYRENE	<10
TOTAL XYLENES	<10

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	117
BFB (%)	107
TOLUENE-D8 (%)	98

Analytical Technologies, Inc. ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

ATI I.D. : 01207003

MATRIX : WATER

UNITS : UG/L

COMPOUNDS	RESULTS
NONE DETECTED	N/A

Analytical**Technologies**,Inc.

GCMS - RESULTS

ATI I.D. : 01207004

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

CLIENT	: SIMON-EEI INC.	DATE SAMPLED	: 12/05/90
PROJECT #	: 512-345	DATE RECEIVED	: 12/06/90
PROJECT NAME	: (NONE)	DATE EXTRACTED	: N/A
CLIENT I.D.	: W-03	DATE ANALYZED	: 12/16/90
SAMPLE MATRIX	: WATER	UNITS	: UG/L
		DILUTION FACTOR	: 20

COMPOUNDS	RESULTS
CHLOROMETHANE	<200
BROMOMETHANE	<200
VINYL CHLORIDE	<20
CHLOROETHANE	<20
METHYLENE CHLORIDE	<100
ACETONE	<400
CARBON DISULFIDE	<20
1,1-DICHLOROETHENE	<20
1,1-DICHLOROETHANE	<20
1,2-DICHLOROETHENE (TOTAL)	73
CHLOROFORM	<20
1,2-DICHLOROETHANE	<20
2-BUTANONE (MEK)	<400
1,1,1-TRICHLOROETHANE	<20
CARBON TETRACHLORIDE	<20
VINYL ACETATE	<200
BROMODICHLOROMETHANE	<20
1,1,2,2-TETRACHLOROETHANE	<20
1,2-DICHLOROPROPANE	<20
CIS-1,3-DICHLOROPROPENE	<20
TRICHLOROETHENE	2600
DIBROMOCHLOROMETHANE	<20
1,1,2 TRICHLOROETHANE	<20
BENZENE	<20
TRANS-1,3-DICHLOROPROPENE	<20
BROMOFORM	<100
2-HEXANONE (MBK)	<200
4-METHYL-2-PENTANONE (MIBK)	<200
TETRACHLOROETHENE	290
TOLUENE	<40
CHLOROBENZENE	<20
ETHYL BENZENE	<20
STYRENE	<20
TOTAL XYLENES	<20

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	110
BFB (%)	108
TOLUENE-D8 (%)	97

Analytical Technologies, Inc. ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

ATI I.D. : 01207004

MATRIX : WATER

UNITS : UG/L

COMPOUNDS	RESULTS
NONE DETECTED	N/A

AnalyticalTechnologies,Inc.

GCMS - RESULTS

ATI I.D. : 01207005

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

CLIENT	: SIMON-EEI INC.	DATE SAMPLED	: 12/05/90
PROJECT #	: 512-345	DATE RECEIVED	: 12/06/90
PROJECT NAME	: (NONE)	DATE EXTRACTED	: N/A
CLIENT I.D.	: W-04	DATE ANALYZED	: 12/17/90
SAMPLE MATRIX	: WATER	UNITS	: UG/L
		DILUTION FACTOR	: 40

COMPOUNDS	RESULTS
CHLOROMETHANE	<400
BROMOMETHANE	<400
VINYL CHLORIDE	<40
CHLOROETHANE	<40
METHYLENE CHLORIDE	<200
ACETONE	<800
CARBON DISULFIDE	<40
1,1-DICHLOROETHENE	46
1,1-DICHLOROETHANE	<40
1,2-DICHLOROETHENE (TOTAL)	330
CHLOROFORM	<40
1,2-DICHLOROETHANE	<40
2-BUTANONE (MEK)	<800
1,1,1-TRICHLOROETHANE	<40
CARBON TETRACHLORIDE	<40
VINYL ACETATE	<400
BROMODICHLOROMETHANE	<40
1,1,2,2-TETRACHLOROETHANE	<40
1,2-DICHLOROPROPANE	<40
CIS-1,3-DICHLOROPROPENE	<40
TRICHLOROETHENE	7200
DIBROMOCHLOROMETHANE	<40
1,1,2 TRICHLOROETHANE	<40
BENZENE	<40
TRANS-1,3-DICHLOROPROPENE	<40
BROMOFORM	<200
2-HEXANONE (MBK)	<400
4-METHYL-2-PENTANONE (MIBK)	<400
TETRACHLOROETHENE	1600
TOLUENE	<80
CHLOROBENZENE	<40
ETHYL BENZENE	<40
STYRENE	<40
TOTAL XYLENES	<40

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	104
BFB (%)	108
TOLUENE-D8 (%)	96

AnalyticalTechnologies,Inc. ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

ATI I.D. : 01207005

MATRIX : WATER

UNITS : UG/L

COMPOUNDS	RESULTS
NONE DETECTED	N/A

AnalyticalTechnologies,Inc.

GCMS - RESULTS

ATI I.D. : 01207006

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

CLIENT	: SIMON-EEI INC.	DATE SAMPLED	: 12/05/90
PROJECT #	: 512-345	DATE RECEIVED	: 12/06/90
PROJECT NAME	: (NONE)	DATE EXTRACTED	: N/A
CLIENT I.D.	: W-05	DATE ANALYZED	: 12/16/90
SAMPLE MATRIX	: WATER	UNITS	: UG/L
		DILUTION FACTOR	: 100

COMPOUNDS	RESULTS
CHLOROMETHANE	<1000
BROMOMETHANE	<1000
VINYL CHLORIDE	<100
CHLOROETHANE	<100
METHYLENE CHLORIDE	<500
ACETONE	<2000
CARBON DISULFIDE	<100
1,1-DICHLOROETHENE	<100
1,1-DICHLOROETHANE	<100
1,2-DICHLOROETHENE (TOTAL)	670
CHLOROFORM	<100
1,2-DICHLOROETHANE	<100
2-BUTANONE (MEK)	<2000
1,1,1-TRICHLOROETHANE	<100
CARBON TETRACHLORIDE	<100
VINYL ACETATE	<1000
BROMODICHLOROMETHANE	<100
1,1,2,2-TETRACHLOROETHANE	<100
1,2-DICHLOROPROPANE	<100
CIS-1,3-DICHLOROPROPENE	<100
TRICHLOROETHENE	21000
DIBROMOCHLOROMETHANE	<100
1,1,2 TRICHLOROETHANE	<100
BENZENE	<100
TRANS-1,3-DICHLOROPROPENE	<100
BROMOFORM	<500
2-HEXANONE (MBK)	<1000
4-METHYL-2-PENTANONE (MIBK)	<1000
TETRACHLOROETHENE	8100
TOLUENE	<200
CHLOROBENZENE	<100
ETHYL BENZENE	<100
STYRENE	<100
TOTAL XYLENES	<100

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	121
BFB (%)	109
TOLUENE-D8 (%)	95

Analytical**Technologies**, Inc. ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

ATI I.D. : 01207006

MATRIX : WATER

UNITS : UG/L

COMPOUNDS	RESULTS
NONE DETECTED	N/A

Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 01207007

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

CLIENT	: SIMON-EEI INC.	DATE SAMPLED	: 12/05/90
PROJECT #	: 512-345	DATE RECEIVED	: 12/06/90
PROJECT NAME	: (NONE)	DATE EXTRACTED	: N/A
CLIENT I.D.	: W-06	DATE ANALYZED	: 12/16/90
SAMPLE MATRIX	: WATER	UNITS	: UG/L
		DILUTION FACTOR	: 100

COMPOUNDS	RESULTS
CHLOROMETHANE	<1000
BROMOMETHANE	<1000
VINYL CHLORIDE	<100
CHLOROETHANE	<100
METHYLENE CHLORIDE	<500
ACETONE	<2000
CARBON DISULFIDE	<100
1,1-DICHLOROETHENE	<100
1,1-DICHLOROETHANE	<100
1,2-DICHLOROETHENE (TOTAL)	270
CHLOROFORM	<100
1,2-DICHLOROETHANE	<100
2-BUTANONE (MEK)	<2000
1,1,1-TRICHLOROETHANE	<100
CARBON TETRACHLORIDE	<100
VINYL ACETATE	<1000
BROMODICHLOROMETHANE	<100
1,1,2,2-TETRACHLOROETHANE	<100
1,2-DICHLOROPROPANE	<100
CIS-1,3-DICHLOROPROPENE	<100
TRICHLOROETHENE	27000
DIBROMOCHLOROMETHANE	<100
1,1,2 TRICHLOROETHANE	<100
BENZENE	<100
TRANS-1,3-DICHLOROPROPENE	<100
BROMOFORM	<500
2-HEXANONE (MBK)	<1000
4-METHYL-2-PENTANONE (MIBK)	<1000
TETRACHLOROETHENE	11000
TOLUENE	<200
CHLOROBENZENE	<100
ETHYL BENZENE	<100
STYRENE	<100
TOTAL XYLENES	<100

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	117
BFB (%)	109
TOLUENE-D8 (%)	96

Analytical**Technologies**, Inc.

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

ATI I.D. : 01207007

MATRIX : WATER

UNITS : UG/L

COMPOUNDS	RESULTS
NONE DETECTED	N/A

AnalyticalTechnologies,Inc.

GCMS - RESULTS

ATI I.D. : 01207008

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

CLIENT	: SIMON-EEI INC.	DATE SAMPLED	: 12/05/90
PROJECT #	: 512-345	DATE RECEIVED	: 12/06/90
PROJECT NAME	: (NONE)	DATE EXTRACTED	: N/A
CLIENT I.D.	: W-22	DATE ANALYZED	: 12/17/90
SAMPLE MATRIX	: WATER	UNITS	: UG/L
		DILUTION FACTOR	: 25

COMPOUNDS	RESULTS
CHLOROMETHANE	<250
BROMOMETHANE	<250
VINYL CHLORIDE	<25
CHLOROETHANE	<25
METHYLENE CHLORIDE	<125
ACETONE	<500
CARBON DISULFIDE	<25
1,1-DICHLOROETHENE	64
1,1-DICHLOROETHANE	<25
1,2-DICHLOROETHENE (TOTAL)	330
CHLOROFORM	<25
1,2-DICHLOROETHANE	<25
2-BUTANONE (MEK)	<500
1,1,1-TRICHLOROETHANE	<25
CARBON TETRACHLORIDE	<25
VINYL ACETATE	<250
BROMODICHLOROMETHANE	<25
1,1,2,2-TETRACHLOROETHANE	<25
1,2-DICHLOROPROPANE	<25
CIS-1,3-DICHLOROPROPENE	<25
TRICHLOROETHENE	7200
DIBROMOCHLOROMETHANE	<25
1,1,2 TRICHLOROETHANE	<25
BENZENE	<25
TRANS-1,3-DICHLOROPROPENE	<25
BROMOFORM	<125
2-HEXANONE (MBK)	<250
4-METHYL-2-PENTANONE (MIBK)	<250
TETRACHLOROETHENE	1600
TOLUENE	<50
CHLOROBENZENE	<25
ETHYL BENZENE	<25
STYRENE	<25
TOTAL XYLENES	<25

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	102
BFB (%)	108
TOLUENE-D8 (%)	97

AnalyticalTechnologies,Inc. ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

ATI I.D. : 01207008

MATRIX : WATER

UNITS : UG/L

COMPOUNDS	RESULTS
NONE DETECTED	N/A

AnalyticalTechnologies,Inc.

GCMS - RESULTS

REAGENT BLANK

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

CLIENT	: SIMON-EEI INC.	ATI I.D.	: 012070
PROJECT #	: 512-345	DATE EXTRACTED	: N/A
PROJECT NAME	: (NONE)	DATE ANALYZED	: 12/15/90
CLIENT I.D.	: REAGENT BLANK	UNITS	: UG/L
		DILUTION FACTOR	: N/A

COMPOUNDS	RESULTS
CHLOROMETHANE	<10
BROMOMETHANE	<10
VINYL CHLORIDE	<1
CHLOROETHANE	<1
METHYLENE CHLORIDE	<5
ACETONE	<20
CARBON DISULFIDE	<1
1,1-DICHLOROETHENE	<1
1,1-DICHLOROETHANE	<1
1,2-DICHLOROETHENE (TOTAL)	<1
CHLOROFORM	<1
1,2-DICHLOROETHANE	<1
2-BUTANONE (MEK)	<20
1,1,1-TRICHLOROETHANE	<1
CARBON TETRACHLORIDE	<1
VINYL ACETATE	<10
BROMODICHLOROMETHANE	<1
1,1,2,2-TETRACHLOROETHANE	<1
1,2-DICHLOROPROPANE	<1
CIS-1,3-DICHLOROPROPENE	<1
TRICHLOROETHENE	<1
DIBROMOCHLOROMETHANE	<1
1,1,2 TRICHLOROETHANE	<1
BENZENE	<1
TRANS-1,3-DICHLOROPROPENE	<1
BROMOFORM	<5
2-HEXANONE (MBK)	<10
4-METHYL-2-PENTANONE (MIBK)	<10
TETRACHLOROETHENE	<1
TOLUENE	<2
CHLOROBENZENE	<1
ETHYL BENZENE	<1
STYRENE	<1
TOTAL XYLENES	<1

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	95
BFB (%)	105
TOLUENE-D8 (%)	100

AnalyticalTechnologies,Inc.

GCMS - RESULTS

REAGENT BLANK

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

CLIENT : SIMON-EEI INC.

ATI I.D. : 012070

UNITS : UG/L

COMPOUNDS	RESULTS
NONE DETECTED	N/A

AnalyticalTechnologies,Inc.

GCMS - RESULTS

REAGENT BLANK

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

CLIENT	: SIMON-EEI INC.	ATI I.D.	: 012070
PROJECT #	: 512-345	DATE EXTRACTED	: N/A
PROJECT NAME	: (NONE)	DATE ANALYZED	: 12/16/90
CLIENT I.D.	: REAGENT BLANK	UNITS	: UG/L
		DILUTION FACTOR	: N/A

COMPOUNDS	RESULTS
CHLOROMETHANE	<10
BROMOMETHANE	<10
VINYL CHLORIDE	<1
CHLOROETHANE	<1
METHYLENE CHLORIDE	6
ACETONE	<20
CARBON DISULFIDE	<1
1,1-DICHLOROETHENE	<1
1,1-DICHLOROETHANE	<1
1,2-DICHLOROETHENE (TOTAL)	<1
CHLOROFORM	<1
1,2-DICHLOROETHANE	<1
2-BUTANONE (MEK)	<20
1,1,1-TRICHLOROETHANE	<1
CARBON TETRACHLORIDE	<1
VINYL ACETATE	<10
BROMODICHLOROMETHANE	<1
1,1,2,2-TETRACHLOROETHANE	<1
1,2-DICHLOROPROPANE	<1
CIS-1,3-DICHLOROPROPENE	<1
TRICHLOROETHENE	<1
DIBROMOCHLOROMETHANE	<1
1,1,2 TRICHLOROETHANE	<1
BENZENE	<1
TRANS-1,3-DICHLOROPROPENE	<1
BROMOFORM	<5
2-HEXANONE (MBK)	<10
4-METHYL-2-PENTANONE (MIBK)	<10
TETRACHLOROETHENE	<1
TOLUENE	<2
CHLOROBENZENE	<1
ETHYL BENZENE	<1
STYRENE	<1
TOTAL XYLENES	<1

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	100
BFB (%)	105
TOLUENE-D8 (%)	99

Analytical Technologies, Inc. GCMS - RESULTS

REAGENT BLANK

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

CLIENT : SIMON-EEI INC.

ATI I.D. : 012070

UNITS : UG/L

COMPOUNDS	RESULTS
NONE DETECTED	N/A

Analytical Technologies, Inc.

QUALITY CONTROL DATA

ATI I.D. : 012070

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

CLIENT : SIMON-EEI INC.
PROJECT # : 512-345
PROJECT NAME : (NONE)
REF I.D. : 01207001

DATE EXTRACTED : N/A
DATE ANALYZED : 12/16/90
SAMPLE MATRIX : WATER
UNITS : UG/L

COMPOUNDS	SAMPLE RESULT	CONC. SPIKED	SPIKED SAMPLE	% REC.	DUP. SPIKED SAMPLE	DUP. % REC.	RPD
1,1-DICHLOROETHENE	<1	41	34	83	38	93	11
TRICHLOROETHENE	<1	55	49	89	46	84	6
CHLOROBENZENE	<1	55	49	83	49	83	0
TOLUENE	<2	59	52	88	51	86	2
BENZENE	<1	59	50	85	48	81	5

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Spiked Sample Result} - \text{Duplicate Spike Sample Result})}{\text{Average of Spiked Sample}} \times 100$$

Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 01207001

TEST : EPA 8270 (GC/MS FOR SEMIVOLATILE ORGANICS)

CLIENT	: SIMON-EEI INC.	DATE SAMPLED	: 12/05/90
PROJECT #	: 512-345	DATE RECEIVED	: 12/06/90
PROJECT NAME	: (NONE)	DATE EXTRACTED	: 12/10/90
CLIENT I.D.	: W-00	DATE ANALYZED	: 12/19/90
SAMPLE MATRIX	: WATER	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
N-NITROSODIMETHYLAMINE	<10
PHENOL	<10
ANILINE	<10
BIS(2-CHLOROETHYL)ETHER	<10
2-CHLOROPHENOL	<10
1,3-DICHLOROBENZENE	<10
1,4-DICHLOROBENZENE	<10
BENZYL ALCOHOL	<10
1,2-DICHLOROBENZENE	<10
2-METHYLPHENOL	<10
BIS(2-CHLOROISOPROPYL)ETHER	<10
4-METHYLPHENOL	<10
N-NITROSO-DI-N-PROPYLAMINE	<10
HEXACHLOROETHANE	<10
NITROBENZENE	<10
ISOPHORONE	<10
2-NITROPHENOL	<10
2,4-DIMETHYLPHENOL	<10
BENZOIC ACID	<50
BIS(2-CHLOROETHOXY)METHANE	<10
2,4-DICHLOROPHENOL	<10
1,2,4-TRICHLOROBENZENE	<10
NAPHTHALENE	<10
4-CHLOROANILINE	<10
HEXACHLOROBUTADIENE	<10
4-CHLORO-3-METHYLPHENOL	<10
2-METHYLNAPHTHALENE	<10
HEXACHLOROCYCLOPENTADIENE	<10
2,4,6-TRICHLOROPHENOL	<10
2,4,5-TRICHLOROPHENOL	<50
2-CHLORONAPHTHALENE	<10
2-NITROANILINE	<50
DIMETHYL PHTHALATE	<10
ACENAPHTHYLENE	<10
3-NITROANILINE	<50
ACENAPHTHENE	<10
2,4-DINITROPHENOL	<50
4-NITROPHENOL	<50
DIBENZOFURAN	<10
2,4-DINITROTOLUENE	<10
2,6-DINITROTOLUENE	<10
DIETHYL PHTHALATE	<10

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Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 01207001

TEST : EPA 8270 (GC/MS FOR SEMIVOLATILE ORGANICS)

COMPOUNDS	RESULTS
4-CHLOROPHENYL PHENYL ETHER	<10
FLUORENE	<10
4-NITROANILINE	<50
4,6-DINITRO-2-METHYLPHENOL	<50
N-NITROSODIPHENYLAMINE	<10
4-BROMOPHENYL PHENYL ETHER	<10
HEXACHLOROBENZENE	<10
PENTACHLOROPHENOL	<50
PHENANTHRENE	<10
ANTHRACENE	<10
DI-N-BUTYL PHTHALATE	<10
FLUORANTHENE	<10
PYRENE	<10
BUTYLBENZYLPHTHALATE	<10
3,3-DICHLOROBENZIDINE	<20
BENZO(a)ANTHRACENE	<10
BIS(2-ETHYLHEXYL)PHTHALATE	<10
CHRYSENE	<10
DI-N-OCTYL PHTHALATE	72
BENZO(b)FLUORANTHENE	<10
BENZO(k)FLUORANTHENE	<10
BENZO(a)PYRENE	<10
INDENO(1,2,3-cd)PYRENE	<10
DIBENZO(a,h)ANTHRACENE	<10
BENZO(g,h,i)PERYLENE	<10

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	61
2-FLUOROBIPHENYL (%)	82
TERPHENYL (%)	89
PHENOL-D6 (%)	61
2-FLUOROPHENOL (%)	72
2,4,6-TRIBROMOPHENOL (%)	86

Analytical Technologies, Inc. ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : EPA 8270 (GC/MS FOR SEMIVOLATILE ORGANICS)

ATI I.D. : 01207001

MATRIX : WATER

UNITS : UG/L

COMPOUNDS	RESULTS
NONE DETECTED	N/A

Analytical**Technologies**,Inc.

GCMS - RESULTS

ATI I.D. : 01207002

TEST : EPA 8270 (GC/MS FOR SEMIVOLATILE ORGANICS)

CLIENT	: SIMON-EEI INC.	DATE SAMPLED	: 12/05/90
PROJECT #	: 512-345	DATE RECEIVED	: 12/06/90
PROJECT NAME	: (NONE)	DATE EXTRACTED	: 12/10/90
CLIENT I.D.	: W-01	DATE ANALYZED	: 12/19/90
SAMPLE MATRIX	: WATER	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
N-NITROSODIMETHYLAMINE	<10
PHENOL	<10
ANILINE	<10
BIS(2-CHLOROETHYL)ETHER	<10
2-CHLOROPHENOL	<10
1,3-DICHLOROBENZENE	<10
1,4-DICHLOROBENZENE	<10
BENZYL ALCOHOL	<10
1,2-DICHLOROBENZENE	<10
2-METHYLPHENOL	<10
BIS(2-CHLOROISOPROPYL)ETHER	<10
4-METHYLPHENOL	<10
N-NITROSO-DI-N-PROPYLAMINE	<10
HEXACHLOROETHANE	<10
NITROBENZENE	<10
ISOPHORONE	<10
2-NITROPHENOL	<10
2,4-DIMETHYLPHENOL	<10
BENZOIC ACID	<50
BIS(2-CHLOROETHOXY)METHANE	<10
2,4-DICHLOROPHENOL	<10
1,2,4-TRICHLOROBENZENE	<10
NAPHTHALENE	<10
4-CHLOROANILINE	<10
HEXACHLOROBUTADIENE	<10
4-CHLORO-3-METHYLPHENOL	<10
2-METHYLNAPHTHALENE	<10
HEXACHLOROCYCLOPENTADIENE	<10
2,4,6-TRICHLOROPHENOL	<10
2,4,5-TRICHLOROPHENOL	<50
2-CHLORONAPHTHALENE	<10
2-NITROANILINE	<50
DIMETHYL PHTHALATE	<10
ACENAPHTHYLENE	<10
3-NITROANILINE	<50
ACENAPHTHENE	<10
2,4-DINITROPHENOL	<50
4-NITROPHENOL	<50
DIBENZOFURAN	<10
2,4-DINITROTOLUENE	<10
2,6-DINITROTOLUENE	<10
DIETHYL PHTHALATE	<10

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AnalyticalTechnologies,Inc.

GCMS - RESULTS

ATI I.D. : 01207002

TEST : EPA 8270 (GC/MS FOR SEMIVOLATILE ORGANICS)

COMPOUNDS	RESULTS
4-CHLOROPHENYL PHENYL ETHER	<10
FLUORENE	<10
4-NITROANILINE	<50
4,6-DINITRO-2-METHYLPHENOL	<50
N-NITROSODIPHENYLAMINE	<10
4-BROMOPHENYL PHENYL ETHER	<10
HEXACHLOROBENZENE	<10
PENTACHLOROPHENOL	<50
PHENANTHRENE	<10
ANTHRACENE	<10
DI-N-BUTYL PHTHALATE	<10
FLUORANTHENE	<10
PYRENE	<10
BUTYLBENZYLPHTHALATE	<10
3,3-DICHLOROBENZIDINE	<20
BENZO(a)ANTHRACENE	<10
BIS(2-ETHYLHEXYL)PHTHALATE	<10
CHRYSENE	<10
DI-N-OCTYL PHTHALATE	<10
BENZO(b)FLUORANTHENE	<10
BENZO(k)FLUORANTHENE	<10
BENZO(a)PYRENE	<10
INDENO(1,2,3-cd)PYRENE	<10
DIBENZO(a,h)ANTHRACENE	<10
BENZO(g,h,i)PERYLENE	<10

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	10*
2-FLUOROBIPHENYL (%)	76
TERPHENYL (%)	63
PHENOL-D6 (%)	57
2-FLUOROPHENOL (%)	76
2,4,6-TRIBROMOPHENOL (%)	68

* Result out of limits due to sample matrix interference

Analytical Technologies, Inc.

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : EPA 8270 (GC/MS FOR SEMIVOLATILE ORGANICS)

ATI I.D. : 01207002

MATRIX : WATER

UNITS : UG/L

COMPOUNDS	RESULTS
385 BUTANOIC ACID	200
392 CARBOXYLIC ACID	40
405 CARBOXYLIC ACID	50
423 CARBOXYLIC ACID	60

Analytical**Technologies**,Inc.

GCMS - RESULTS

ATI I.D. : 01207003

TEST : EPA 8270 (GC/MS FOR SEMIVOLATILE ORGANICS)

CLIENT	: SIMON-EEI INC.	DATE SAMPLED	: 12/05/90
PROJECT #	: 512-345	DATE RECEIVED	: 12/06/90
PROJECT NAME	: (NONE)	DATE EXTRACTED	: 12/10/90
CLIENT I.D.	: W-02	DATE ANALYZED	: 12/27/90
SAMPLE MATRIX	: WATER	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
N-NITROSODIMETHYLAMINE	<10
PHENOL	<10
ANILINE	<10
BIS(2-CHLOROETHYL)ETHER	<10
2-CHLOROPHENOL	<10
1,3-DICHLOROBENZENE	<10
1,4-DICHLOROBENZENE	<10
BENZYL ALCOHOL	<10
1,2-DICHLOROBENZENE	<10
2-METHYLPHENOL	<10
BIS(2-CHLOROISOPROPYL)ETHER	<10
4-METHYLPHENOL	<10
N-NITROSO-DI-N-PROPYLAMINE	<10
HEXACHLOROETHANE	<10
NITROBENZENE	<10
ISOPHORONE	<10
2-NITROPHENOL	<10
2,4-DIMETHYLPHENOL	<10
BENZOIC ACID	<50
BIS(2-CHLOROETHOXY)METHANE	<10
2,4-DICHLOROPHENOL	<10
1,2,4-TRICHLOROBENZENE	<10
NAPHTHALENE	<10
4-CHLOROANILINE	<10
HEXACHLOROBUTADIENE	<10
4-CHLORO-3-METHYLPHENOL	<10
2-METHYLNAPHTHALENE	<10
HEXACHLOROCYCLOPENTADIENE	<10
2,4,6-TRICHLOROPHENOL	<10
2,4,5-TRICHLOROPHENOL	<50
2-CHLORONAPHTHALENE	<10
2-NITROANILINE	<50
DIMETHYL PHTHALATE	<10
ACENAPHTHYLENE	<10
3-NITROANILINE	<50
ACENAPHTHENE	<10
2,4-DINITROPHENOL	<50
4-NITROPHENOL	<50
DIBENZOFURAN	<10
2,4-DINITROTOLUENE	<10
2,6-DINITROTOLUENE	<10
DIETHYL PHTHALATE	<10

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Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 01207003

TEST : EPA 8270 (GC/MS FOR SEMIVOLATILE ORGANICS)

COMPOUNDS	RESULTS
4-CHLOROPHENYL PHENYL ETHER	<10
FLUORENE	<10
4-NITROANILINE	<50
4,6-DINITRO-2-METHYLPHENOL	<50
N-NITROSODIPHENYLAMINE	<10
4-BROMOPHENYL PHENYL ETHER	<10
HEXACHLOROBENZENE	<10
PENTACHLOROPHENOL	<50
PHENANTHRENE	<10
ANTHRACENE	<10
DI-N-BUTYL PHTHALATE	<10
FLUORANTHENE	<10
PYRENE	<10
BUTYLBENZYLPHTHALATE	<10
3,3-DICHLOROBENZIDINE	<20
BENZO(a)ANTHRACENE	<10
BIS(2-ETHYLHEXYL)PHTHALATE	<10
CHRYSENE	<10
DI-N-OCTYL PHTHALATE	<10
BENZO(b)FLUORANTHENE	<10
BENZO(k)FLUORANTHENE	<10
BENZO(a)PYRENE	<10
INDENO(1,2,3-cd)PYRENE	<10
DIBENZO(a,h)ANTHRACENE	<10
BENZO(g,h,i)PERYLENE	<10

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	80
2-FLUOROBIPHENYL (%)	85
TERPHENYL (%)	75
PHENOL-D6 (%)	12
2-FLUOROPHENOL (%)	16*
2,4,6-TRIBROMOPHENOL (%)	33

* Result out of limits due to sample matrix interference

Analytical Technologies, Inc.

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : EPA 8270 (GC/MS FOR SEMIVOLATILE ORGANICS)

ATI I.D. : 01207003

MATRIX : WATER

UNITS : UG/L

COMPOUNDS	RESULTS
1278 CYCLIC HYDROCARBON	50

AnalyticalTechnologies,Inc. GCMS - RESULTS

ATI I.D. : 01207004

TEST : EPA 8270 (GC/MS FOR SEMIVOLATILE ORGANICS)

CLIENT	: SIMON-EEI INC.	DATE SAMPLED	: 12/05/90
PROJECT #	: 512-345	DATE RECEIVED	: 12/06/90
PROJECT NAME	: (NONE)	DATE EXTRACTED	: 12/10/90
CLIENT I.D.	: W-03	DATE ANALYZED	: 12/19/90
SAMPLE MATRIX	: WATER	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
N-NITROSODIMETHYLAMINE	<10
PHENOL	<10
ANILINE	<10
BIS(2-CHLOROETHYL)ETHER	<10
2-CHLOROPHENOL	<10
1,3-DICHLOROBENZENE	<10
1,4-DICHLOROBENZENE	<10
BENZYL ALCOHOL	<10
1,2-DICHLOROBENZENE	<10
2-METHYLPHENOL	<10
BIS(2-CHLOROISOPROPYL)ETHER	<10
4-METHYLPHENOL	<10
N-NITROSO-DI-N-PROPYLAMINE	<10
HEXACHLOROETHANE	<10
NITROBENZENE	<10
ISOPHORONE	<10
2-NITROPHENOL	<10
2,4-DIMETHYLPHENOL	<10
BENZOIC ACID	<50
BIS(2-CHLOROETHOXY)METHANE	<10
2,4-DICHLOROPHENOL	<10
1,2,4-TRICHLOROBENZENE	<10
NAPHTHALENE	<10
4-CHLOROANILINE	<10
HEXACHLOROBUTADIENE	<10
4-CHLORO-3-METHYLPHENOL	<10
2-METHYLNAPHTHALENE	<10
HEXACHLOROCYCLOPENTADIENE	<10
2,4,6-TRICHLOROPHENOL	<10
2,4,5-TRICHLOROPHENOL	<50
2-CHLORONAPHTHALENE	<10
2-NITROANILINE	<50
DIMETHYL PHTHALATE	<10
ACENAPHTHYLENE	<10
3-NITROANILINE	<50
ACENAPHTHENE	<10
2,4-DINITROPHENOL	<50
4-NITROPHENOL	<50
DIBENZOFURAN	<10
2,4-DINITROTOLUENE	<10
2,6-DINITROTOLUENE	<10
DIETHYL PHTHALATE	<10

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AnalyticalTechnologies,Inc.

GCMS - RESULTS

ATI I.D. : 01207004

TEST : EPA 8270 (GC/MS FOR SEMIVOLATILE ORGANICS)

COMPOUNDS	RESULTS
4-CHLOROPHENYL PHENYL ETHER	<10
FLUORENE	<10
4-NITROANILINE	<50
4,6-DINITRO-2-METHYLPHENOL	<50
N-NITROSODIPHENYLAMINE	<10
4-BROMOPHENYL PHENYL ETHER	<10
HEXACHLOROBENZENE	<10
PENTACHLOROPHENOL	<50
PHENANTHRENE	<10
ANTHRACENE	<10
DI-N-BUTYL PHTHALATE	<10
FLUORANTHENE	<10
PYRENE	<10
BUTYLBENZYLPHTHALATE	<10
3,3-DICHLOROBENZIDINE	<20
BENZO(a)ANTHRACENE	<10
BIS(2-ETHYLHEXYL)PHTHALATE	<10
CHRYSENE	<10
DI-N-OCTYL PHTHALATE	<10
BENZO(b)FLUORANTHENE	<10
BENZO(k)FLUORANTHENE	<10
BENZO(a)PYRENE	<10
INDENO(1,2,3-cd)PYRENE	<10
DIBENZO(a,h)ANTHRACENE	<10
BENZO(g,h,i)PERYLENE	<10

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	76
2-FLUOROBIPHENYL (%)	86
TERPHENYL (%)	73
PHENOL-D6 (%)	66
2-FLUOROPHENOL (%)	74
2,4,6-TRIBROMOPHENOL (%)	71

Analytical Technologies, Inc. ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : EPA 8270 (GC/MS FOR SEMIVOLATILE ORGANICS)

ATI I.D. : 01207004

MATRIX : WATER

UNITS : UG/L

COMPOUNDS	RESULTS
NONE DETECTED	N/A

Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 01207005

TEST : EPA 8270 (GC/MS FOR SEMIVOLATILE ORGANICS)

CLIENT	: SIMON-EEI INC.	DATE SAMPLED	: 12/05/90
PROJECT #	: 512-345	DATE RECEIVED	: 12/06/90
PROJECT NAME	: (NONE)	DATE EXTRACTED	: 12/10/90
CLIENT I.D.	: W-04	DATE ANALYZED	: 12/19/90
SAMPLE MATRIX	: WATER	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
N-NITROSODIMETHYLAMINE	<10
PHENOL	<10
ANILINE	<10
BIS(2-CHLOROETHYL)ETHER	<10
2-CHLOROPHENOL	<10
1,3-DICHLOROBENZENE	<10
1,4-DICHLOROBENZENE	<10
BENZYL ALCOHOL	<10
1,2-DICHLOROBENZENE	<10
2-METHYLPHENOL	<10
BIS(2-CHLOROISOPROPYL)ETHER	<10
4-METHYLPHENOL	<10
N-NITROSO-DI-N-PROPYLAMINE	<10
HEXACHLOROETHANE	<10
NITROBENZENE	<10
ISOPHORONE	<10
2-NITROPHENOL	<10
2,4-DIMETHYLPHENOL	<10
BENZOIC ACID	<50
BIS(2-CHLOROETHOXY)METHANE	<10
2,4-DICHLOROPHENOL	<10
1,2,4-TRICHLOROBENZENE	<10
NAPHTHALENE	<10
4-CHLOROANILINE	<10
HEXACHLOROBUTADIENE	<10
4-CHLORO-3-METHYLPHENOL	<10
2-METHYLNAPHTHALENE	<10
HEXACHLOROCYCLOPENTADIENE	<10
2,4,6-TRICHLOROPHENOL	<10
2,4,5-TRICHLOROPHENOL	<50
2-CHLORONAPHTHALENE	<10
2-NITROANILINE	<50
DIMETHYL PHTHALATE	<10
ACENAPHTHYLENE	<10
3-NITROANILINE	<50
ACENAPHTHENE	<10
2,4-DINITROPHENOL	<50
4-NITROPHENOL	<50
DIBENZOFURAN	<10
2,4-DINITROTOLUENE	<10
2,6-DINITROTOLUENE	<10
DIETHYL PHTHALATE	<10

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AnalyticalTechnologies,Inc.

GCMS - RESULTS

ATI I.D. : 01207005

TEST : EPA 8270 (GC/MS FOR SEMIVOLATILE ORGANICS)

COMPOUNDS	RESULTS
4-CHLOROPHENYL PHENYL ETHER	<10
FLUORENE	<10
4-NITROANILINE	<50
4,6-DINITRO-2-METHYLPHENOL	<50
N-NITROSODIPHENYLAMINE	<10
4-BROMOPHENYL PHENYL ETHER	<10
HEXACHLOROBENZENE	<10
PENTACHLOROPHENOL	<50
PHENANTHRENE	<10
ANTHRACENE	<10
DI-N-BUTYL PHTHALATE	<10
FLUORANTHENE	<10
PYRENE	<10
BUTYLBENZYLPHTHALATE	<10
3,3-DICHLOROBENZIDINE	<20
BENZO(a)ANTHRACENE	<10
BIS(2-ETHYLHEXYL)PHTHALATE	<10
CHRYSENE	<10
DI-N-OCTYL PHTHALATE	<10
BENZO(b)FLUORANTHENE	<10
BENZO(k)FLUORANTHENE	<10
BENZO(a)PYRENE	<10
INDENO(1,2,3-cd)PYRENE	<10
DIBENZO(a,h)ANTHRACENE	<10
BENZO(g,h,i)PERYLENE	<10

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	64
2-FLUOROBIPHENYL (%)	75
TERPHENYL (%)	73
PHENOL-D6 (%)	32
2-FLUOROPHENOL (%)	45
2,4,6-TRIBROMOPHENOL (%)	50

Analytical Technologies, Inc. ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : EPA 8270 (GC/MS FOR SEMIVOLATILE ORGANICS)

ATI I.D. : 01207005

MATRIX : WATER

UNITS : UG/L

COMPOUNDS	RESULTS
NONE DETECTED	N/A

AnalyticalTechnologies,Inc.

GCMS - RESULTS

ATI I.D. : 01207006

TEST : EPA 8270 (GC/MS FOR SEMIVOLATILE ORGANICS)

CLIENT	: SIMON-EEI INC.	DATE SAMPLED	: 12/05/90
PROJECT #	: 512-345	DATE RECEIVED	: 12/06/90
PROJECT NAME	: (NONE)	DATE EXTRACTED	: 12/10/90
CLIENT I.D.	: W-05	DATE ANALYZED	: 12/27/90
SAMPLE MATRIX	: WATER	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
N-NITROSODIMETHYLAMINE	<10
PHENOL	<10
ANILINE	<10
BIS(2-CHLOROETHYL)ETHER	<10
2-CHLOROPHENOL	<10
1,3-DICHLOROBENZENE	<10
1,4-DICHLOROBENZENE	<10
BENZYL ALCOHOL	<10
1,2-DICHLOROBENZENE	<10
2-METHYLPHENOL	<10
BIS(2-CHLOROISOPROPYL)ETHER	<10
4-METHYLPHENOL	<10
N-NITROSO-DI-N-PROPYLAMINE	<10
HEXACHLOROETHANE	<10
NITROBENZENE	<10
ISOPHORONE	<10
2-NITROPHENOL	<10
2,4-DIMETHYLPHENOL	<10
BENZOIC ACID	<50
BIS(2-CHLOROETHOXY)METHANE	<10
2,4-DICHLOROPHENOL	<10
1,2,4-TRICHLOROBENZENE	<10
NAPHTHALENE	<10
4-CHLOROANILINE	<10
HEXACHLOROBUTADIENE	<10
4-CHLORO-3-METHYLPHENOL	<10
2-METHYLNAPHTHALENE	<10
HEXACHLOROCYCLOPENTADIENE	<10
2,4,6-TRICHLOROPHENOL	<10
2,4,5-TRICHLOROPHENOL	<50
2-CHLORONAPHTHALENE	<10
2-NITROANILINE	<50
DIMETHYL PHTHALATE	<10
ACENAPHTHYLENE	<10
3-NITROANILINE	<50
ACENAPHTHENE	<10
2,4-DINITROPHENOL	<50
4-NITROPHENOL	<50
DIBENZOFURAN	<10
2,4-DINITROTOLUENE	<10
2,6-DINITROTOLUENE	<10
DIETHYL PHTHALATE	<10

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Analytical Technologies, Inc.   GCMS - RESULTS

ATI I.D. : 01207006

TEST : EPA 8270 (GC/MS FOR SEMIVOLATILE ORGANICS)

COMPOUNDS	RESULTS
4-CHLOROPHENYL PHENYL ETHER	<10
FLUORENE	<10
4-NITROANILINE	<50
4,6-DINITRO-2-METHYLPHENOL	<50
N-NITROSODIPHENYLAMINE	<10
4-BROMOPHENYL PHENYL ETHER	<10
HEXACHLOROBENZENE	<10
PENTACHLOROPHENOL	<50
PHENANTHRENE	<10
ANTHRACENE	<10
DI-N-BUTYL PHTHALATE	<10
FLUORANTHENE	<10
PYRENE	<10
BUTYLBENZYLPHTHALATE	<10
3,3-DICHLOROBENZIDINE	<20
BENZO(a)ANTHRACENE	<10
BIS(2-ETHYLHEXYL)PHTHALATE	<10
CHRYSENE	<10
DI-N-OCTYL PHTHALATE	<10
BENZO(b)FLUORANTHENE	<10
BENZO(k)FLUORANTHENE	<10
BENZO(a)PYRENE	<10
INDENO(1,2,3-cd)PYRENE	<10
DIBENZO(a,h)ANTHRACENE	<10
BENZO(g,h,i)PERYLENE	<10

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	74
2-FLUOROBIPHENYL (%)	66
TERPHENYL (%)	53
PHENOL-D6 (%)	40
2-FLUOROPHENOL (%)	54
2,4,6-TRIBROMOPHENOL (%)	41

Analytical Technologies, Inc.

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : EPA 8270 (GC/MS FOR SEMIVOLATILE ORGANICS)

ATI I.D. : 01207006

MATRIX : WATER

UNITS : UG/L

COMPOUNDS	RESULTS
NONE DETECTED	N/A

Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 01207007

TEST : EPA 8270 (GC/MS FOR SEMIVOLATILE ORGANICS)

CLIENT	: SIMON-EEI INC.	DATE SAMPLED	: 12/05/90
PROJECT #	: 512-345	DATE RECEIVED	: 12/06/90
PROJECT NAME	: (NONE)	DATE EXTRACTED	: 12/10/90
CLIENT I.D.	: W-06	DATE ANALYZED	: 12/27/90
SAMPLE MATRIX	: WATER	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
N-NITROSODIMETHYLAMINE	<10
PHENOL	<10
ANILINE	<10
BIS(2-CHLOROETHYL)ETHER	<10
2-CHLOROPHENOL	<10
1,3-DICHLOROBENZENE	<10
1,4-DICHLOROBENZENE	<10
BENZYL ALCOHOL	<10
1,2-DICHLOROBENZENE	<10
2-METHYLPHENOL	<10
BIS(2-CHLOROISOPROPYL)ETHER	<10
4-METHYLPHENOL	<10
N-NITROSO-DI-N-PROPYLAMINE	<10
HEXACHLOROETHANE	<10
NITROBENZENE	<10
ISOPHORONE	<10
2-NITROPHENOL	<10
2,4-DIMETHYLPHENOL	<10
BENZOIC ACID	<50
BIS(2-CHLOROETHOXY)METHANE	<10
2,4-DICHLOROPHENOL	<10
1,2,4-TRICHLOROBENZENE	<10
NAPHTHALENE	<10
4-CHLOROANILINE	<10
HEXACHLOROBUTADIENE	<10
4-CHLORO-3-METHYLPHENOL	<10
2-METHYLNAPHTHALENE	<10
HEXACHLOROCYCLOPENTADIENE	<10
2,4,6-TRICHLOROPHENOL	<10
2,4,5-TRICHLOROPHENOL	<50
2-CHLORONAPHTHALENE	<10
2-NITROANILINE	<50
DIMETHYL PHTHALATE	<10
ACENAPHTHYLENE	<10
3-NITROANILINE	<50
ACENAPHTHENE	<10
2,4-DINITROPHENOL	<50
4-NITROPHENOL	<50
DIBENZOFURAN	<10
2,4-DINITROTOLUENE	<10
2,6-DINITROTOLUENE	<10
DIETHYL PHTHALATE	<10

(CONTINUED NEXT PAGE)

Analytical Technologies, Inc. GCMS - RESULTS

ATI I.D. : 01207007

TEST : EPA 8270 (GC/MS FOR SEMIVOLATILE ORGANICS)

COMPOUNDS	RESULTS
4-CHLOROPHENYL PHENYL ETHER	<10
FLUORENE	<10
4-NITROANILINE	<50
4,6-DINITRO-2-METHYLPHENOL	<50
N-NITROSODIPHENYLAMINE	<10
4-BROMOPHENYL PHENYL ETHER	<10
HEXACHLOROBENZENE	<10
PENTACHLOROPHENOL	<50
PHENANTHRENE	<10
ANTHRACENE	<10
DI-N-BUTYL PHTHALATE	<10
FLUORANTHENE	<10
PYRENE	<10
BUTYLBENZYLPHTHALATE	<10
3,3-DICHLOROBENZIDINE	<20
BENZO(a)ANTHRACENE	<10
BIS(2-ETHYLHEXYL)PHTHALATE	<10
CHRYSENE	<10
DI-N-OCTYL PHTHALATE	<10
BENZO(b)FLUORANTHENE	<10
BENZO(k)FLUORANTHENE	<10
BENZO(a)PYRENE	<10
INDENO(1,2,3-cd)PYRENE	<10
DIBENZO(a,h)ANTHRACENE	<10
BENZO(g,h,i)PERYLENE	<10

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	74
2-FLUOROBIPHENYL (%)	69
TERPHENYL (%)	54
PHENOL-D6 (%)	39
2-FLUOROPHENOL (%)	53
2,4,6-TRIBROMOPHENOL (%)	64

AnalyticalTechnologies,Inc. ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : EPA 8270 (GC/MS FOR SEMIVOLATILE ORGANICS)

ATI I.D. : 01207007

MATRIX : WATER

UNITS : UG/L

COMPOUNDS	RESULTS
NONE DETECTED	N/A

Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 01207008

TEST : EPA 8270 (GC/MS FOR SEMIVOLATILE ORGANICS)

CLIENT : SIMON-EEI INC.
PROJECT # : 512-345
PROJECT NAME : (NONE)
CLIENT I.D. : W-22
SAMPLE MATRIX : WATER

DATE SAMPLED : 12/05/90
DATE RECEIVED : 12/06/90
DATE EXTRACTED : 12/10/90
DATE ANALYZED : 12/27/90
UNITS : UG/L
DILUTION FACTOR : 1

COMPOUNDS	RESULTS
N-NITROSODIMETHYLAMINE	<10
PHENOL	<10
ANILINE	<10
BIS(2-CHLOROETHYL)ETHER	<10
2-CHLOROPHENOL	<10
1,3-DICHLOROBENZENE	<10
1,4-DICHLOROBENZENE	<10
BENZYL ALCOHOL	<10
1,2-DICHLOROBENZENE	<10
2-METHYLPHENOL	<10
BIS(2-CHLOROISOPROPYL)ETHER	<10
4-METHYLPHENOL	<10
N-NITROSO-DI-N-PROPYLAMINE	<10
HEXACHLOROETHANE	<10
NITROBENZENE	<10
ISOPHORONE	<10
2-NITROPHENOL	<10
2,4-DIMETHYLPHENOL	<10
BENZOIC ACID	<50
BIS(2-CHLOROETHOXY)METHANE	<10
2,4-DICHLOROPHENOL	<10
1,2,4-TRICHLOROBENZENE	<10
NAPHTHALENE	<10
4-CHLOROANILINE	<10
HEXACHLOROBUTADIENE	<10
4-CHLORO-3-METHYLPHENOL	<10
2-METHYLNAPHTHALENE	<10
HEXACHLOROCYCLOPENTADIENE	<10
2,4,6-TRICHLOROPHENOL	<10
2,4,5-TRICHLOROPHENOL	<50
2-CHLORONAPHTHALENE	<10
2-NITROANILINE	<50
DIMETHYL PHTHALATE	<10
ACENAPHTHYLENE	<10
3-NITROANILINE	<50
ACENAPHTHENE	<10
2,4-DINITROPHENOL	<50
4-NITROPHENOL	<50
DIBENZOFURAN	<10
2,4-DINITROTOLUENE	<10
2,6-DINITROTOLUENE	<10
DIETHYL PHTHALATE	<10

(CONTINUED NEXT PAGE)

Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 01207008

TEST : EPA 8270 (GC/MS FOR SEMIVOLATILE ORGANICS)

COMPOUNDS	RESULTS
4-CHLOROPHENYL PHENYL ETHER	<10
FLUORENE	<10
4-NITROANILINE	<50
4,6-DINITRO-2-METHYLPHENOL	<50
N-NITROSODIPHENYLAMINE	<10
4-BROMOPHENYL PHENYL ETHER	<10
HEXACHLOROBENZENE	<10
PENTACHLOROPHENOL	<50
PHENANTHRENE	<10
ANTHRACENE	<10
DI-N-BUTYL PHTHALATE	<10
FLUORANTHENE	<10
PYRENE	<10
BUTYLBENZYLPHTHALATE	<10
3,3-DICHLOROBENZIDINE	<20
BENZO(a)ANTHRACENE	<10
BIS(2-ETHYLHEXYL)PHTHALATE	<10
CHRYSENE	<10
DI-N-OCTYL PHTHALATE	<10
BENZO(b)FLUORANTHENE	<10
BENZO(k)FLUORANTHENE	<10
BENZO(a)PYRENE	<10
INDENO(1,2,3-cd)PYRENE	<10
DIBENZO(a,h)ANTHRACENE	<10
BENZO(g,h,i)PERYLENE	<10

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	81
2-FLUOROBIPHENYL (%)	70
TERPHENYL (%)	61
PHENOL-D6 (%)	70
2-FLUOROPHENOL (%)	80
2,4,6-TRIBROMOPHENOL (%)	64

AnalyticalTechnologies,Inc. ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : EPA 8270 (GC/MS FOR SEMIVOLATILE ORGANICS)

ATI I.D. : 01207008

MATRIX : WATER

UNITS : UG/L

COMPOUNDS	RESULTS
NONE DETECTED	N/A

AnalyticalTechnologies,Inc.

GCMS - RESULTS

REAGENT BLANK

TEST : EPA 8270 (GC/MS FOR SEMIVOLATILE ORGANICS)

CLIENT	: SIMON-EEI INC.	ATI I.D.	: 012070
PROJECT #	: 512-345	DATE EXTRACTED	: 12/10/90
PROJECT NAME	: (NONE)	DATE ANALYZED	: 12/26/90
CLIENT I.D.	: REAGENT BLANK	UNITS	: UG/L
		DILUTION FACTOR	: N/A

COMPOUNDS	RESULTS
N-NITROSODIMETHYLAMINE	<10
PHENOL	<10
ANILINE	<10
BIS(2-CHLOROETHYL)ETHER	<10
2-CHLOROPHENOL	<10
1,3-DICHLOROBENZENE	<10
1,4-DICHLOROBENZENE	<10
BENZYL ALCOHOL	<10
1,2-DICHLOROBENZENE	<10
2-METHYLPHENOL	<10
BIS(2-CHLOROISOPROPYL)ETHER	<10
4-METHYLPHENOL	<10
N-NITROSO-DI-N-PROPYLAMINE	<10
HEXACHLOROETHANE	<10
NITROBENZENE	<10
ISOPHORONE	<10
2-NITROPHENOL	<10
2,4-DIMETHYLPHENOL	<10
BENZOIC ACID	<50
BIS(2-CHLOROETHOXY)METHANE	<10
2,4-DICHLOROPHENOL	<10
1,2,4-TRICHLOROBENZENE	<10
NAPHTHALENE	<10
4-CHLOROANILINE	<10
HEXACHLOROBUTADIENE	<10
4-CHLORO-3-METHYLPHENOL	<10
2-METHYLNAPHTHALENE	<10
HEXACHLOROCYCLOPENTADIENE	<10
2,4,6-TRICHLOROPHENOL	<10
2,4,5-TRICHLOROPHENOL	<50
2-CHLORONAPHTHALENE	<10
2-NITROANILINE	<50
DIMETHYL PHTHALATE	<10
ACENAPHTHYLENE	<10
3-NITROANILINE	<50
ACENAPHTHENE	<10
2,4-DINITROPHENOL	<50
4-NITROPHENOL	<50
DIBENZOFURAN	<10
2,4-DINITROTOLUENE	<10
2,6-DINITROTOLUENE	<10
DIETHYL PHTHALATE	<10
4-CHLOROPHENYL PHENYL ETHER	<10

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AnalyticalTechnologies,Inc.

GCMS - RESULTS

REAGENT BLANK

ATI I.D. : 012070

TEST : EPA 8270 (GC/MS FOR SEMIVOLATILE ORGANICS)

COMPOUNDS	RESULTS
FLUORENE	<10
4-NITROANILINE	<50
4,6-DINITRO-2-METHYLPHENOL	<50
N-NITROSODIPHENYLAMINE	<10
4-BROMOPHENYL PHENYL ETHER	<10
HEXACHLOROBENZENE	<10
PENTACHLOROPHENOL	<50
PHENANTHRENE	<10
ANTHRACENE	<10
DI-N-BUTYL PHTHALATE	<10
FLUORANTHENE	<10
PYRENE	<10
BUTYLBENZYLPHTHALATE	<10
3,3-DICHLOROBENZIDINE	<20
BENZO(a)ANTHRACENE	<10
BIS(2-ETHYLHEXYL)PHTHALATE	<10
CHRYSENE	<10
DI-N-OCTYL PHTHALATE	<10
BENZO(b)FLUORANTHENE	<10
BENZO(k)FLUORANTHENE	<10
BENZO(a)PYRENE	<10
INDENO(1,2,3-cd)PYRENE	<10
DIBENZO(a,h)ANTHRACENE	<10
BENZO(g,h,i)PERYLENE	<10

SURROGATE PERCENT RECOVERIES

NITROBENZENE-D5 (%)	80
2-FLUOROBIPHENYL (%)	79
TERPHENYL (%)	95
PHENOL-D6 (%)	63
2-FLUOROPHENOL (%)	67
2,4,6-TRIBROMOPHENOL (%)	75

Analytical Technologies, Inc.

GCMS - RESULTS

REAGENT BLANK

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : EPA 8270 (GC/MS FOR SEMIVOLATILE ORGANICS)

CLIENT : SIMON-EEI INC.

ATI I.D. : 012070

UNITS : UG/L

COMPOUNDS	RESULTS
3-METHYLPHENOL	<10

AnalyticalTechnologies,Inc.

QUALITY CONTROL DATA

ATI I.D. : 012070

TEST : EPA 8270 (GC/MS FOR SEMIVOLATILE ORGANICS)

CLIENT : SIMON-EEI INC.
PROJECT # : 512-345
PROJECT NAME : (NONE)
REF I.D. : REAGENT WATER

DATE EXTRACTED : 12/10/90
DATE ANALYZED : 12/26/90
SAMPLE MATRIX : WATER
UNITS : UG/L

COMPOUNDS	SAMPLE RESULT	CONC. SPIKED	SPIKED SAMPLE	% REC.	DUP. SPIKED SAMPLE	DUP. % REC.	RPD
1,2,4-TRICHLOROBENZENE	<10	100	59	59	71	71	18
ACENAPHTHENE	<10	100	58	58	67	67	14
2,4-DINITROTOLUENE	<10	100	72	72	81	81	12
PYRENE	<10	100	84	84	97	97	14
N-NITROSO-DI-N-PROPYLAMINE	<10	100	45	45	53	53	16
1,4-DICHLOROBENZENE	<10	100	63	63	69	69	9
PENTACHLOROPHENOL	<50	400	324	81	339	85	5
PHENOL	<10	200	122	61	119	60	2
2-CHLOROPHENOL	<10	200	137	68	134	67	2
4-CHLORO-3-METHYLPHENOL	<10	200	152	76	162	81	6
4-NITROPHENOL	<50	400	362	90	350	87	3

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Spiked Sample Result} - \text{Duplicate Spike Sample Result})}{\text{Average of Spiked Sample}} \times 100$$

0/2070

EEI ENGINEERING ENTERPRISES, INC.
21818 WILMINGTON AVE., SUITE 405
LONG BEACH, CA 90810 (213)518-4597

CHAIN OF CUSTODY RECORD

LABORATORY: ATI
5550 MOREHOUSE DR.
San Diego, CA. 92121

PROJECT NO. 512-345

PURCHASE ORDER NO.

SAMPLERS:(signature) L Chnoe

Phone No. 213/430-6500

Phone No: 619/458-9141

Remarks:

ANALYSES REQUESTED

	SAMPLE NO.	DATE	TIME	624	625	Number of Containers	REMARKS
01	W-00-01	12/5/90	AM	X		2	624 bottles inclu
	W-00-02				X	2	a duplicate -
02	W-01-01			X		2	
	W-01-02				X	2	
03	W-02-01			X		2	Proj. Manager:
	W-02-02				X	2	Bill Halbert.
04	W-03-01		PM	X		2	
	W-03-02				X	2	
05	W-04-01			X	~~X~~	2	
	W-04-02			~~X~~	X	2	
06	W-05-01			X		2	
	W-05-02				X	2	
07	W-06-01			X		2	
	W-06-02				X	2	

PINK COPY: SAMPLER RETAINS **YELLOW COPY:** LABORATORY COPY

WHITE COPY: LABORATORY SIGNS AND RETURNS WITH ANALYTICAL RESULTS

TOTAL NUMBER OF CONTAINERS: 28

Relinquished by:(signature)	Received by:(signature)	Date/Time
Leobardo Chaidez	Patrick J. Carlson	12/6/ 105
Patrick J. Carlson	Robert Gullett	12/6/90 8:00
Robert Gullett		
Relinquished by:(signature)	Received for laboratory by:(signature)	Date/Time

012070

EEI [illegible]

Simon-EEI Inc.
6695 E. Pacific Coast Hwy
Long Beach, CA 90803

CHAIN OF CUSTODY RECORD

LABORATORY:	PROJECT NO.	PURCHASE ORDER NO.
ATI 5550 MOREHOUSE Dr. SAN DIEGO, CA. 92121	512-345	
	SAMPLERS:(signature) LChnder	
	Phone No. 213/430-6500	

Phone No: 619/458-9141

Remarks:

SAMPLE NO.	DATE	TIME	ANALYSES REQUESTED: 624	625	Number of Containers	REMARKS
08 w-22-01	12/5/90	PM	X		2	624 bottles include
w-22-02				X	2	a duplicate.
						Proj. Manager:
						Bill Halbert

PINK COPY: SAMPLER RETAINS **YELLOW COPY:** LABORATORY COPY

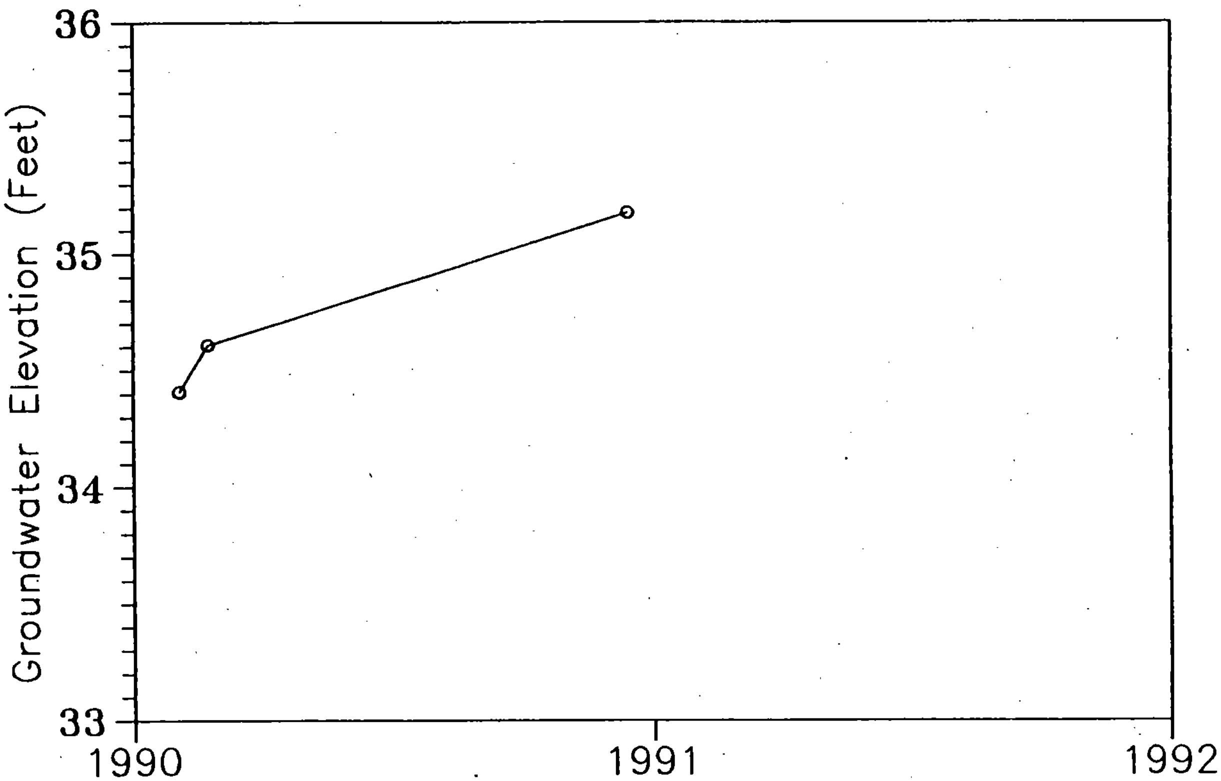
WHITE COPY: LABORATORY SIGNS AND RETURNS WITH ANALYTICAL RESULTS

TOTAL NUMBER OF CONTAINERS: 4

Relinquished by:(signature)	Received by:(signature)	Date/Time
Leobardo Chaidez	Patrick J. Coalm	12/6/90 8:05
Patrick J. Coalm	Robert [illegible]	12/6/90 8:00
Robert [illegible]		
	Received for laboratory by :(signature)	

APPENDIX B

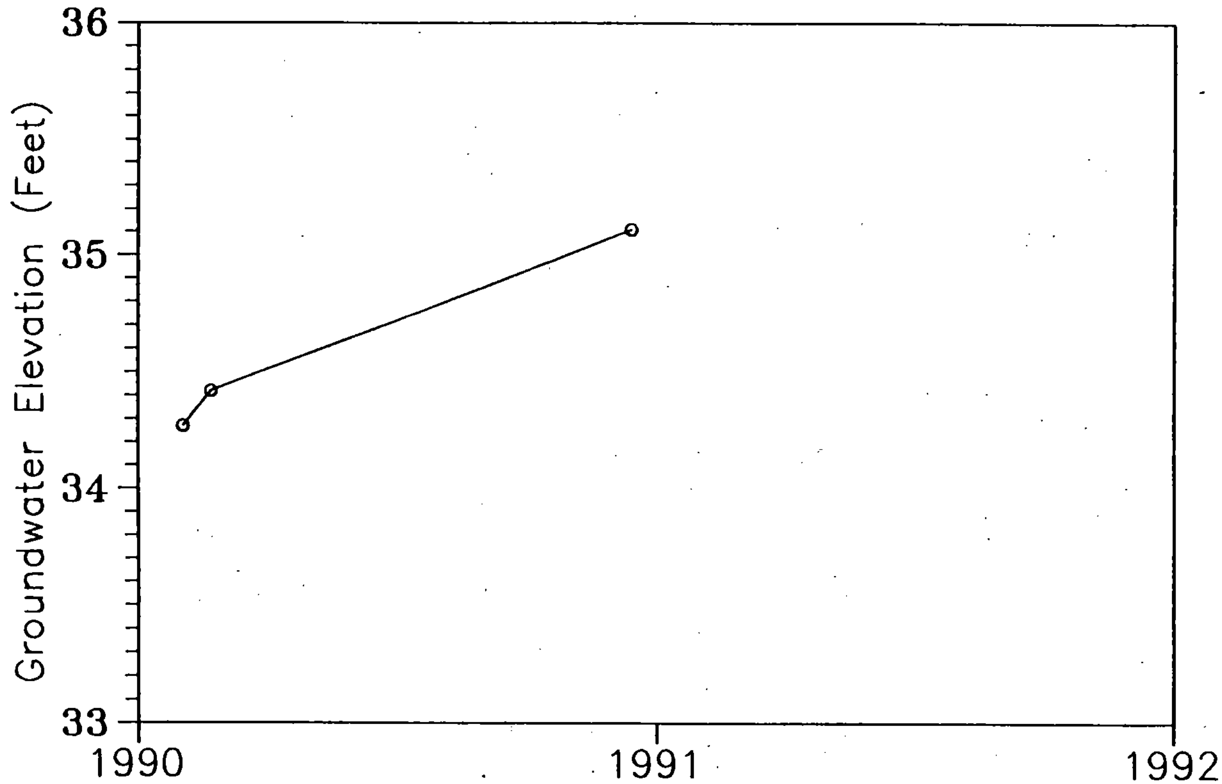
MONITORING WELL HYDROGRAPHS



MONITORING WELL HYDROGRAPH
WELL # 1
1225 WEST 196 TH STREET
TORRANCE, CALIFORNIA

SIMON-EEI Inc.

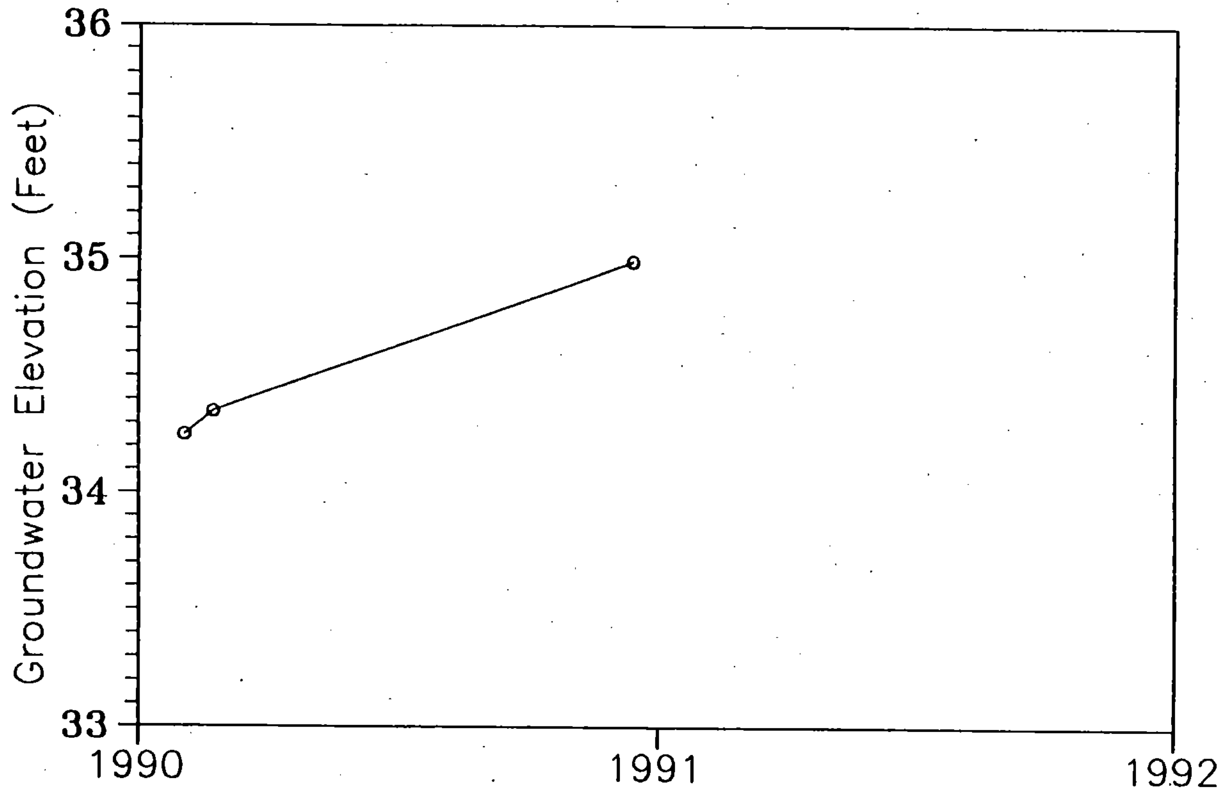
PROJECT NO: 512-345	FIGURE: B-1
DATE: DECEMBER, 1990	



MONITORING WELL HYDROGRAPH
WELL # 2
1225 WEST 196 TH STREET
TORRANCE, CALIFORNIA

SIMON-EEI Inc.

PROJECT NO: 512-345	FIGURE: B-2
DATE: DECEMBER, 1990	



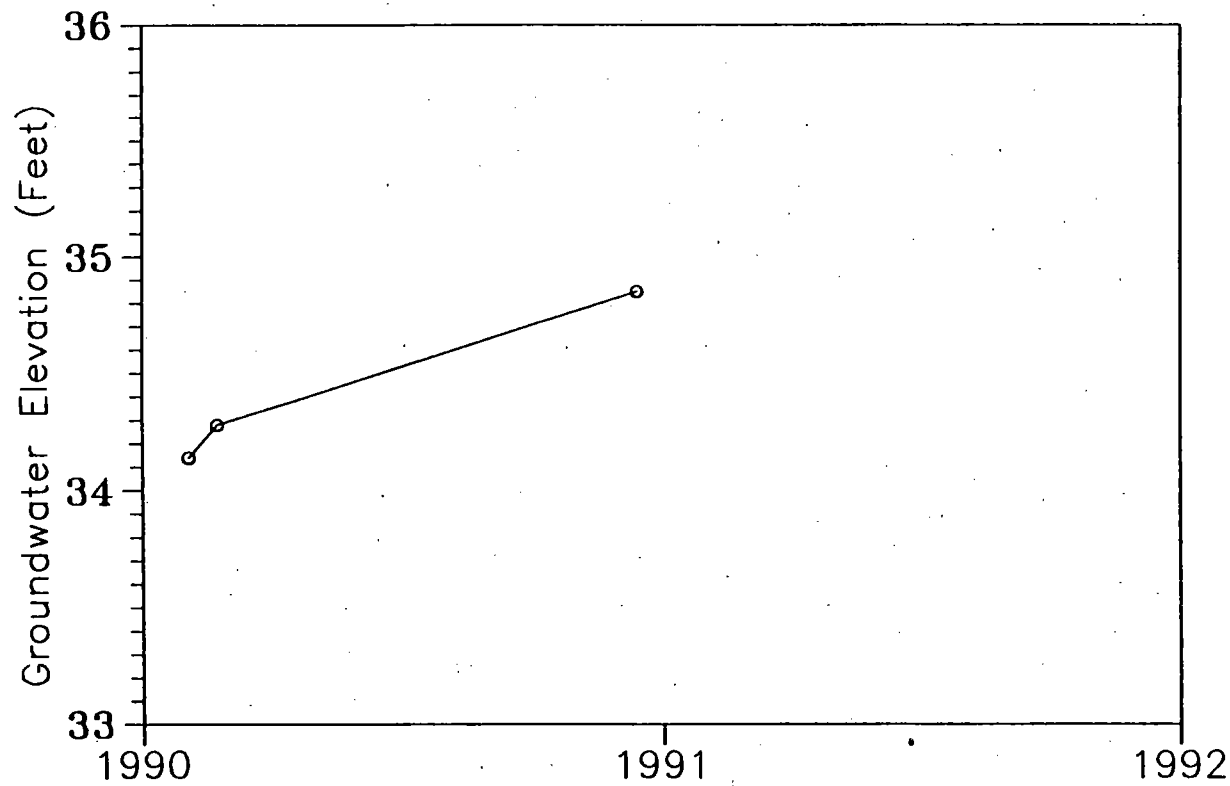
MONITORING WELL HYDROGRAPH
WELL # 3
1225 WEST 196 TH STREET
TORRANCE, CALIFORNIA

SIMON-EEI Inc.

PROJECT NO: 512-345

DATE: DECEMBER, 1990

FIGURE: B-3



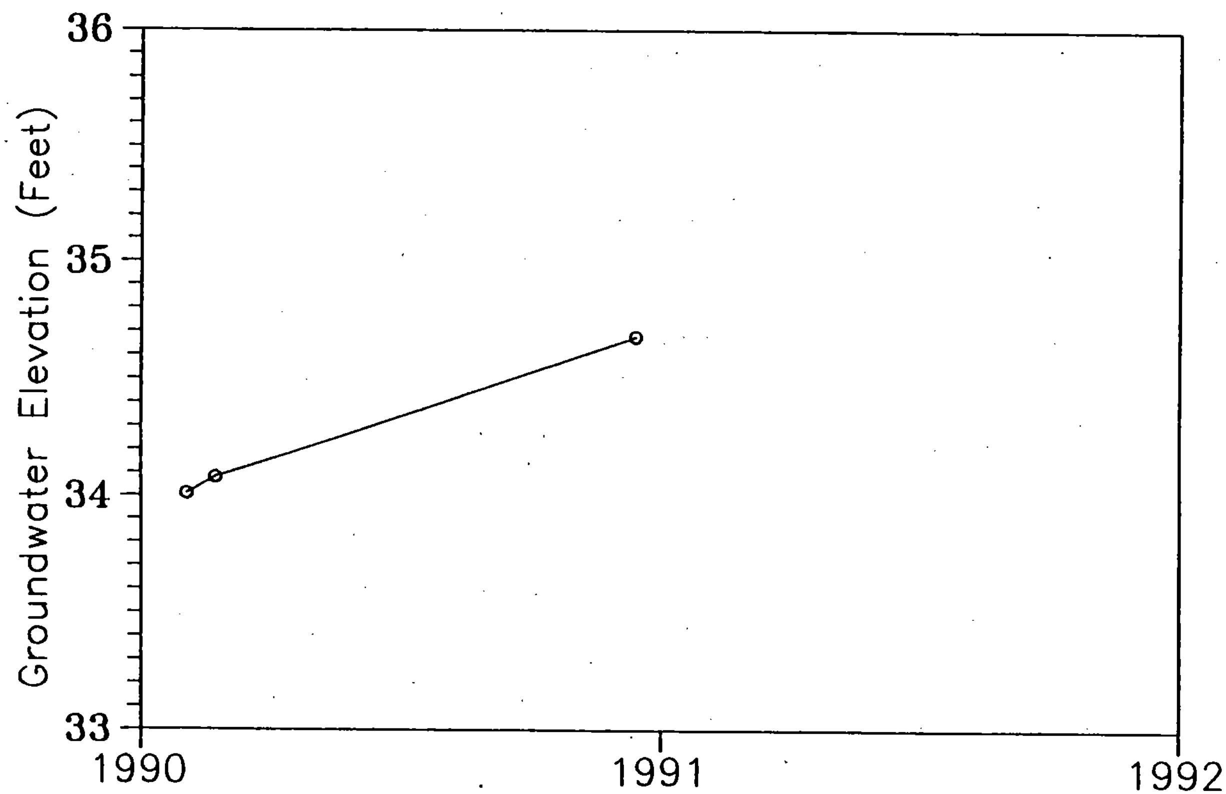
MONITORING WELL HYDROGRAPH
WELL # 4
1225 WEST 196 TH STREET
TORRANCE, CALIFORNIA

SIMON-EEI Inc.

PROJECT NO: 512-345

FIGURE: B-4

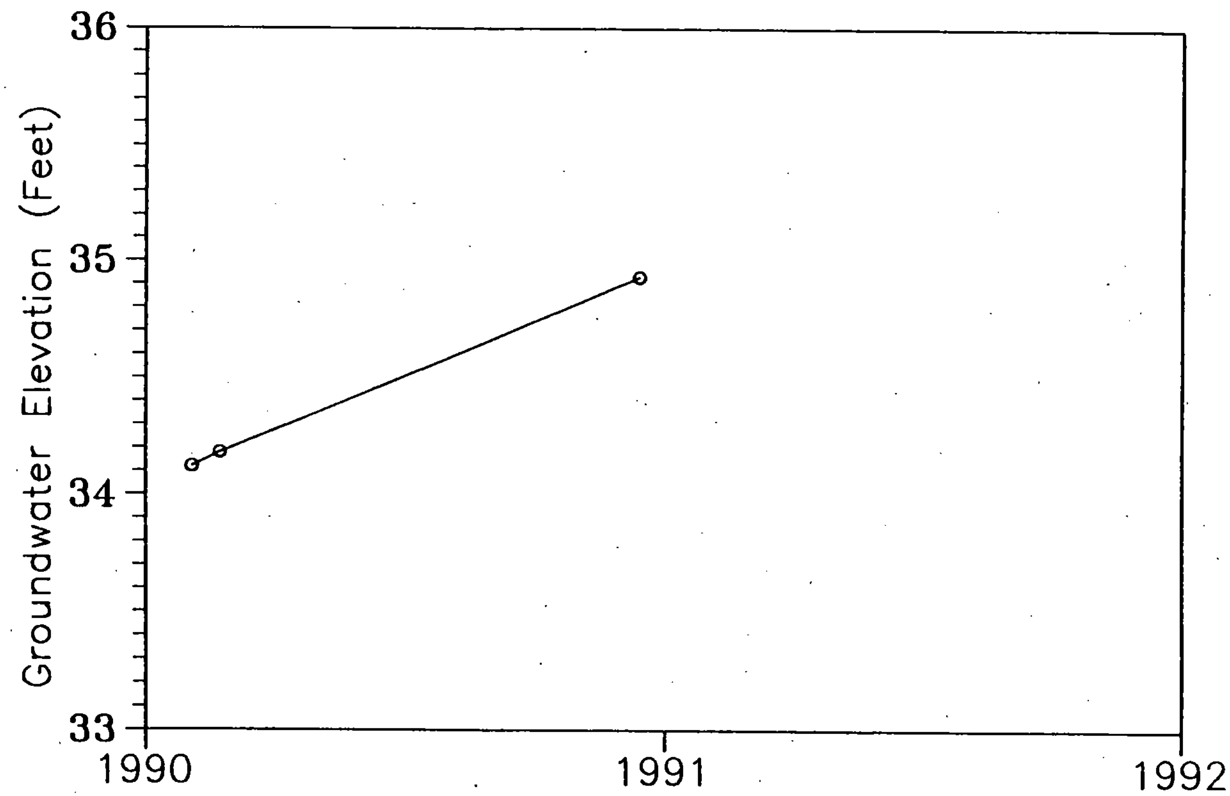
DATE: DECEMBER, 1990



MONITORING WELL HYDROGRAPH
WELL # 5
1225 WEST 196 TH STREET
TORRANCE, CALIFORNIA

SIMON-EEI Inc.

PROJECT NO: 512-345
DATE: DECEMBER, 1990
FIGURE: B-5



MONITORING WELL HYDROGRAPH
WELL # 6
1225 WEST 196 TH STREET
TORRANCE, CALIFORNIA

SIMON-EEI Inc.

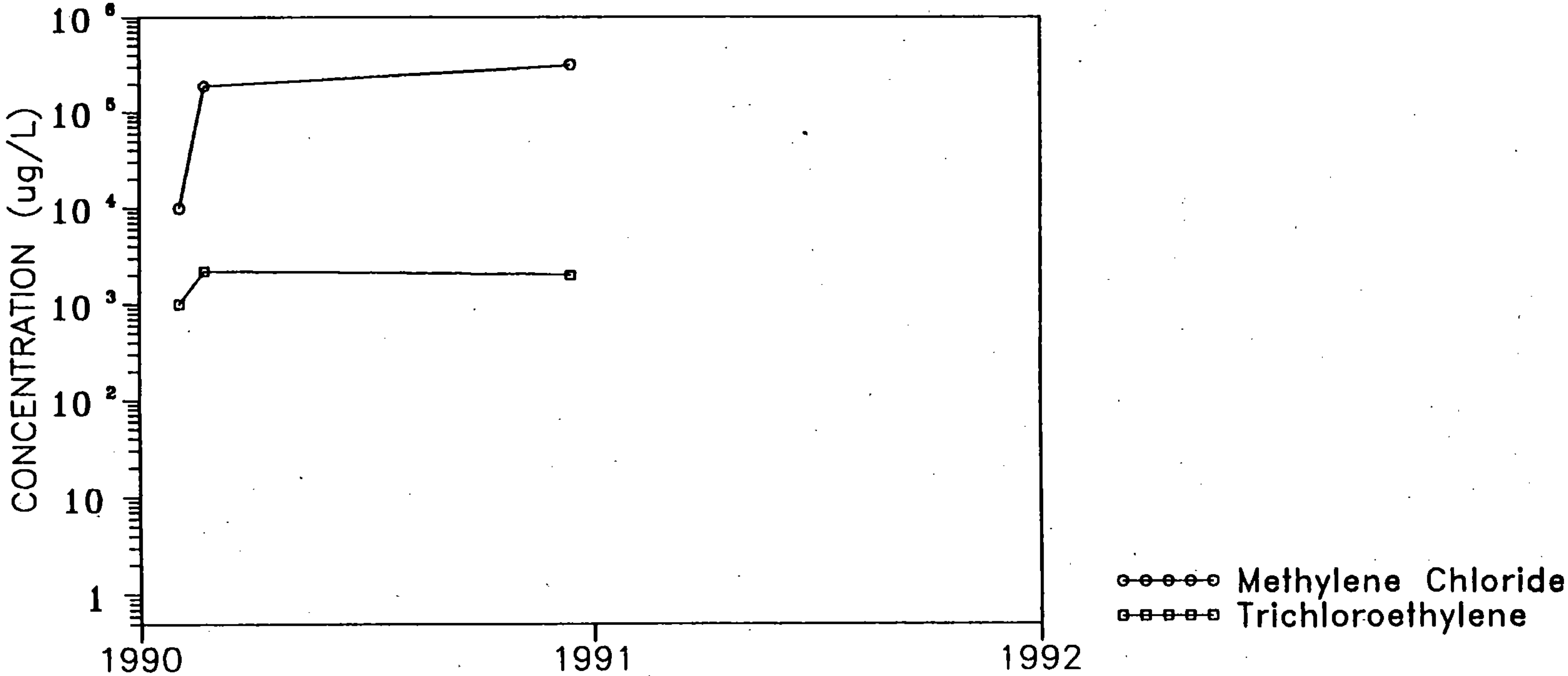
PROJECT NO: 512-345

FIGURE: B-6

DATE: DECEMBER, 1990

APPENDIX C

GRAPHS OF SELECTED ORGANIC COMPOUNDS OVER TIME



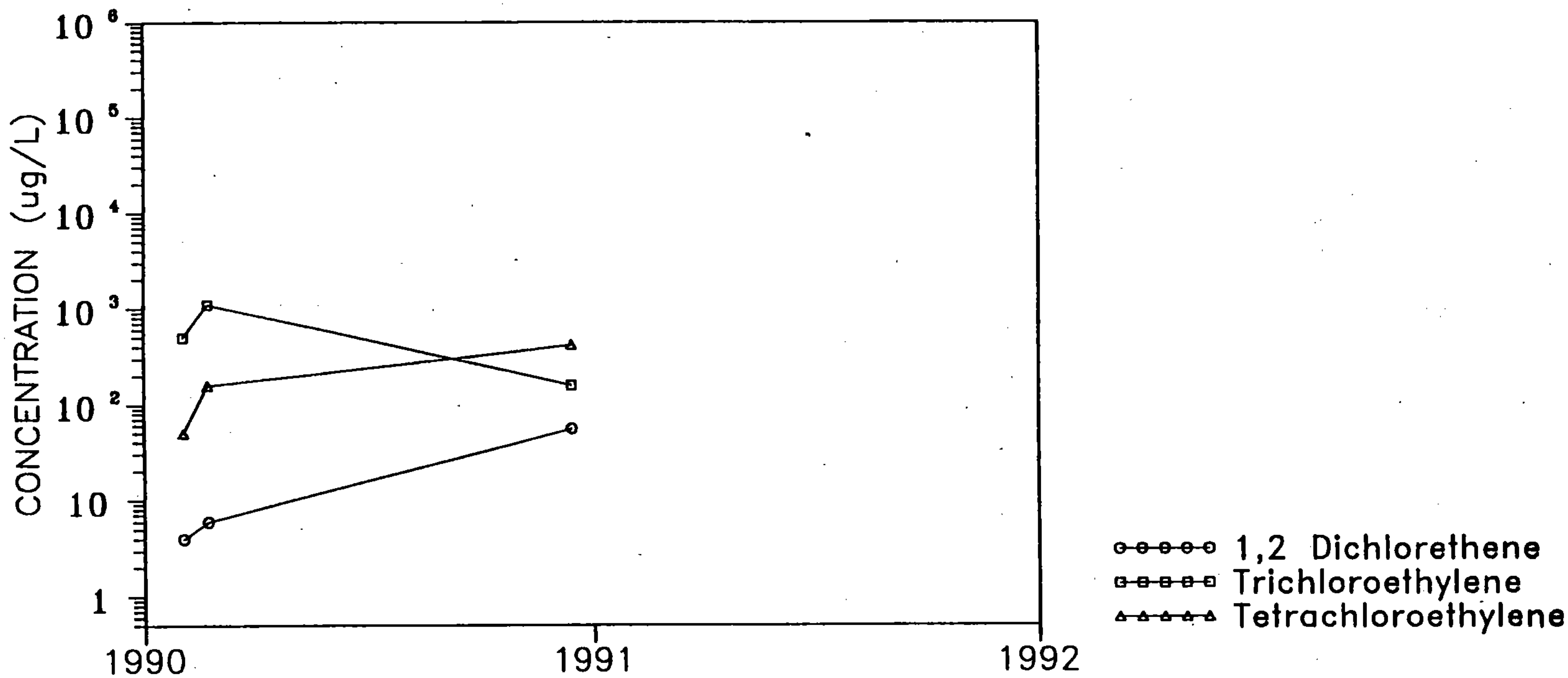
SELECTED ORGANIC COMPOUNDS VERSUS TIME
WELL # 1
1225 WEST 196 TH STREET
TORRANCE, CALIFORNIA

SIMON-EEI Inc.

PROJECT NO: 512-345

FIGURE: C-1

DATE: DECEMBER, 1990



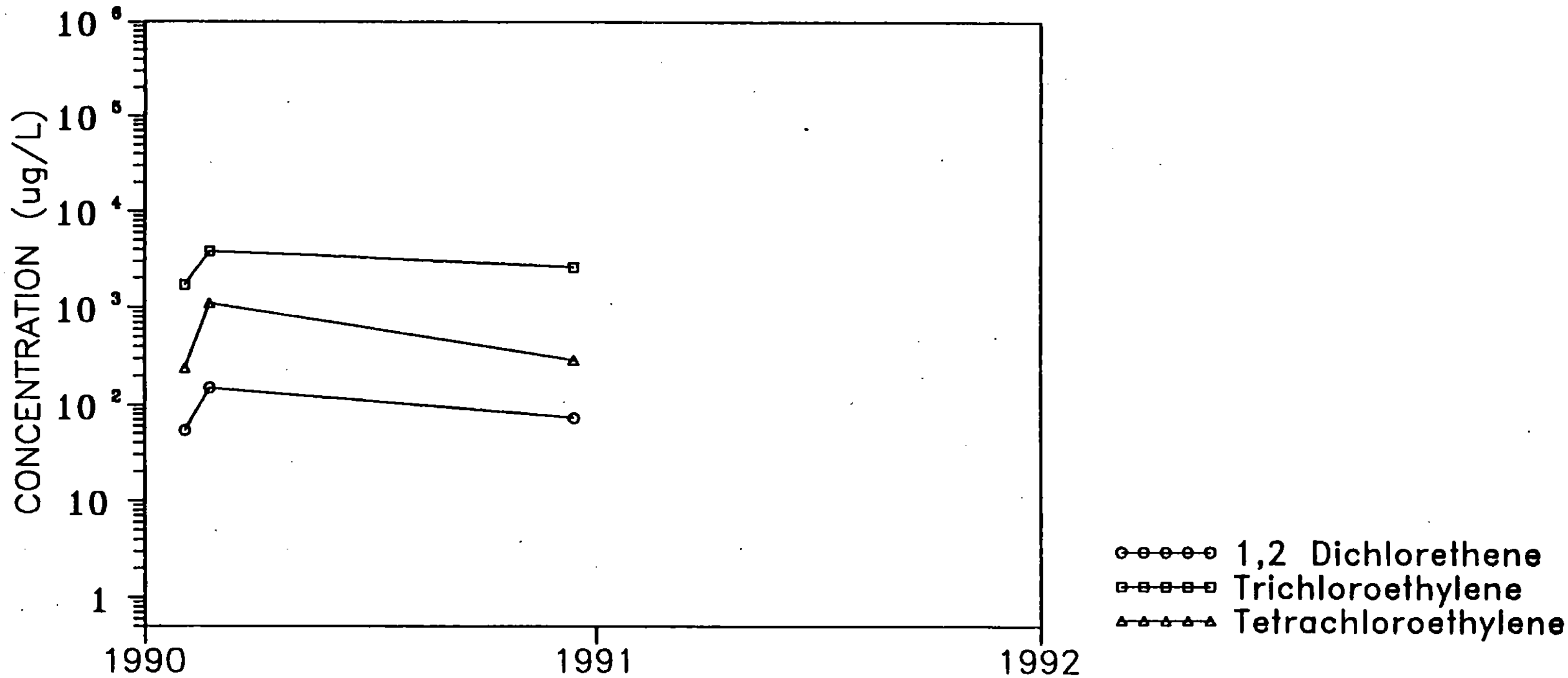
SELECTED ORGANIC COMPOUNDS VERSUS TIME
WELL # 2
1225 WEST 196 TH STREET
TORRANCE, CALIFORNIA

SIMON-EEI Inc.

PROJECT NO: 512-345

DATE: DECEMBER, 1990

FIGURE: C-2



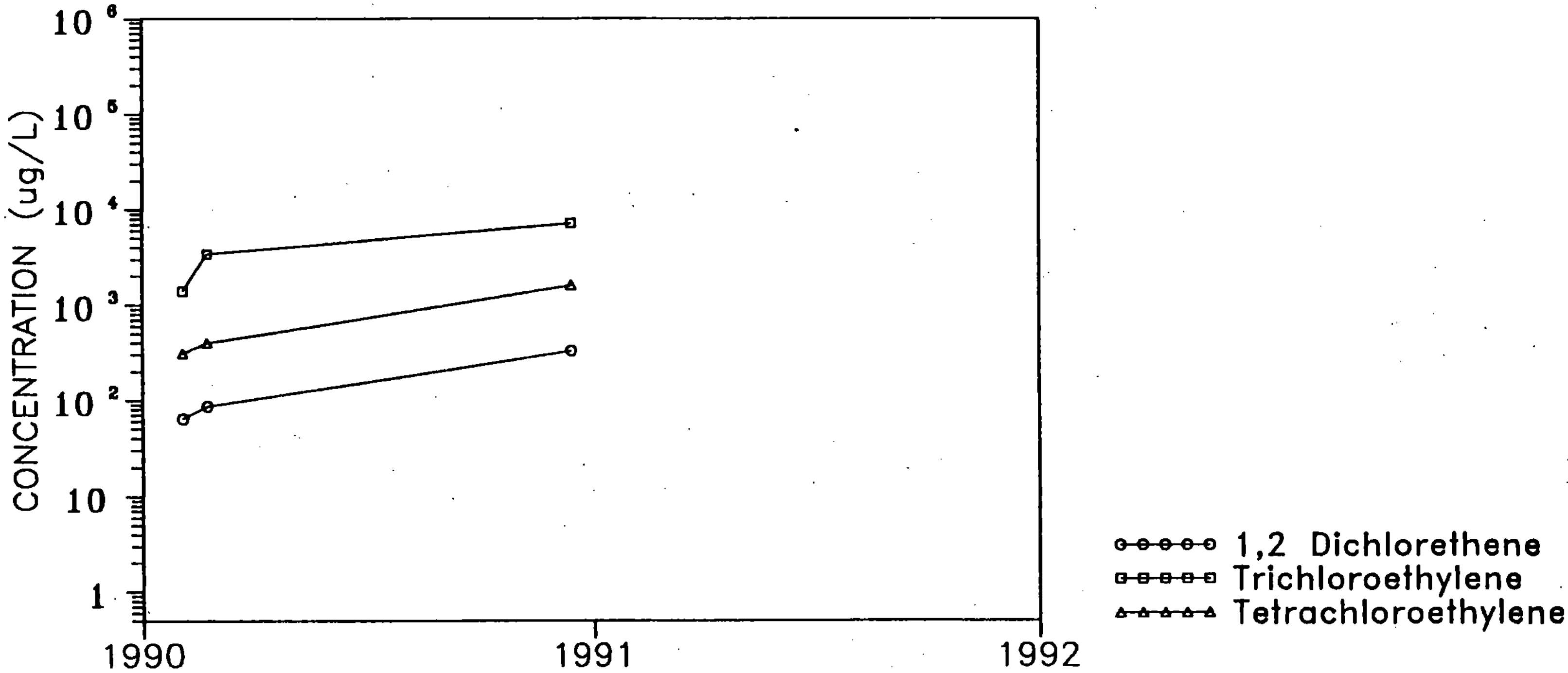
SELECTED ORGANIC COMPOUNDS VERSUS TIME
WELL # 3
1225 WEST 196 TH STREET
TORRANCE, CALIFORNIA

SIMON-EEI Inc.

PROJECT NO: 512-345

DATE: DECEMBER, 1990

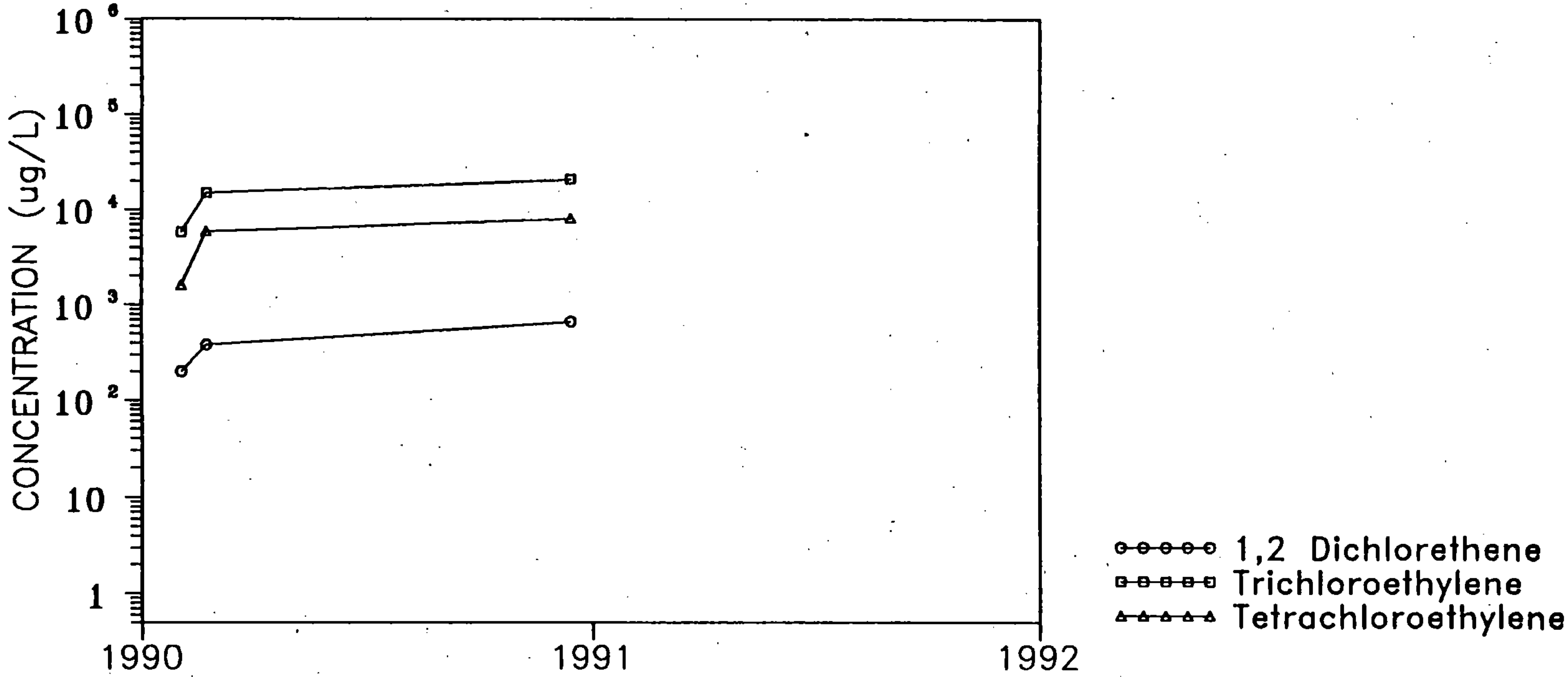
FIGURE: C-3



SELECTED ORGANIC COMPOUNDS VERSUS TIME
WELL #. 4
1225 WEST 196 TH STREET
TORRANCE, CALIFORNIA

SIMON-EEI Inc.

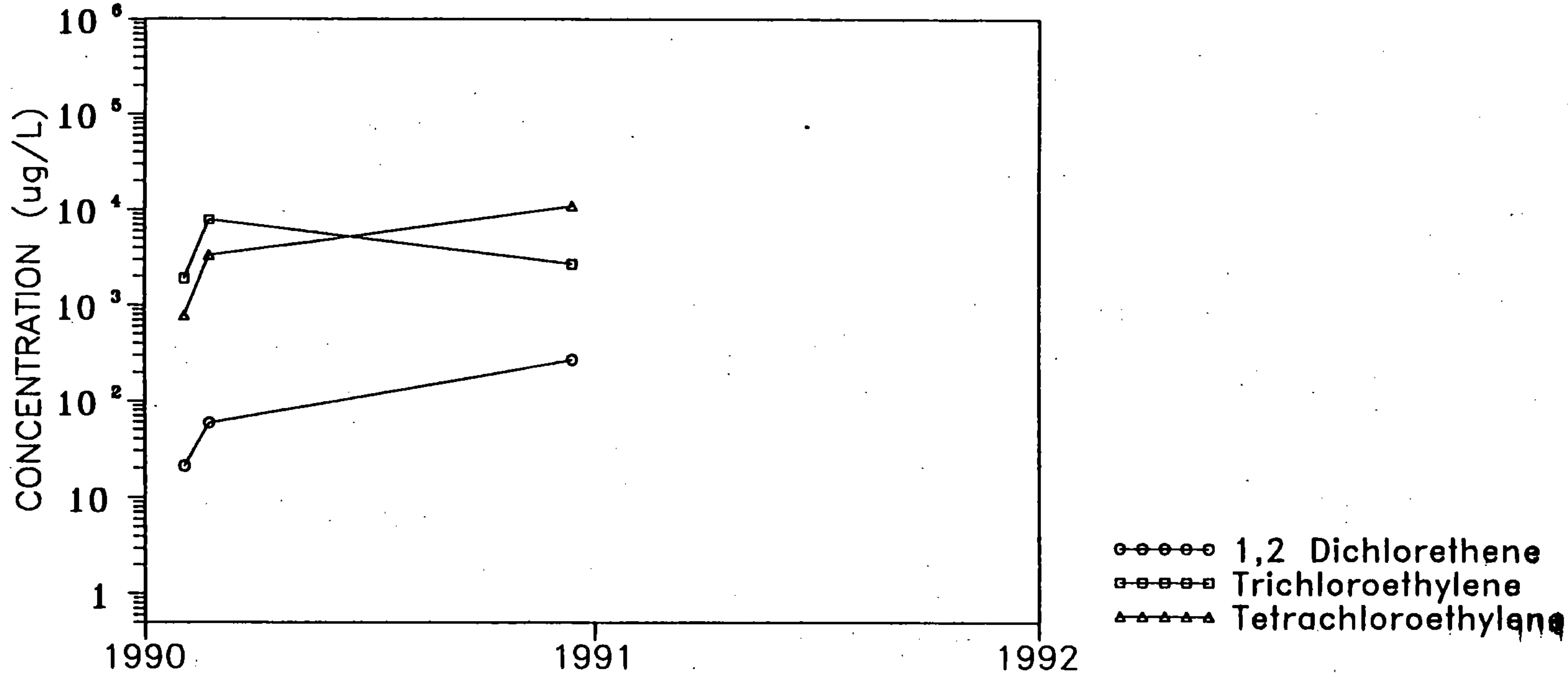
PROJECT NO: 512-345	FIGURE: C-4
DATE: DECEMBER, 1990	



SELECTED ORGANIC COMPOUNDS VERSUS TIME
WELL # 5
1225 WEST 196 TH STREET
TORRANCE, CALIFORNIA

SIMON-EEI Inc.

PROJECT NO: 512-345		FIGURE: C-5
DATE: DECEMBER, 1990		



SELECTED ORGANIC COMPOUNDS VERSUS TIME
WELL #. 6
1225 WEST 196 TH STREET
TORRANCE, CALIFORNIA

SIMON-EEI Inc.

PROJECT NO: 512-345

DATE: DECEMBER, 1990

FIGURE C-6

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0639-2336

REPORT OF ADDITIONAL SUBSURFACE ASSESSMENT AND GROUNDWATER SAMPLING

AMOCO CHEMICAL FACILITY

1225 WEST 196TH STREET

TORRANCE, CALIFORNIA

EEI

ENGINEERING
ENTERPRISES, INC.

WATER RESOURCES SPECIALISTS

REPORT OF ADDITIONAL SUBSURFACE

ASSESSMENT AND GROUNDWATER SAMPLING

AMOCO CHEMICAL FACILITY

1225 WEST 196TH STREET

TORRANCE, CALIFORNIA

Prepared for:

Amoco Chemical Company
1225 West 196th Street
Torrance, California 90502

Submitted by:

Engineering Enterprises, Inc.
6695 East Pacific Coast Highway
Long Beach, California 90803
213/430-6500

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Project Hydrogeologist

Robert T. Bean
Registered Geologist #1339
CEG #483

ENGINEERING ENTERPRISES, INC.

REPORT OF ADDITIONAL SUBSURFACE ASSESSMENT AND GROUNDWATER SAMPLING AMOCO CHEMICAL FACILITY 1225 WEST 196TH STREET TORRANCE, CALIFORNIA

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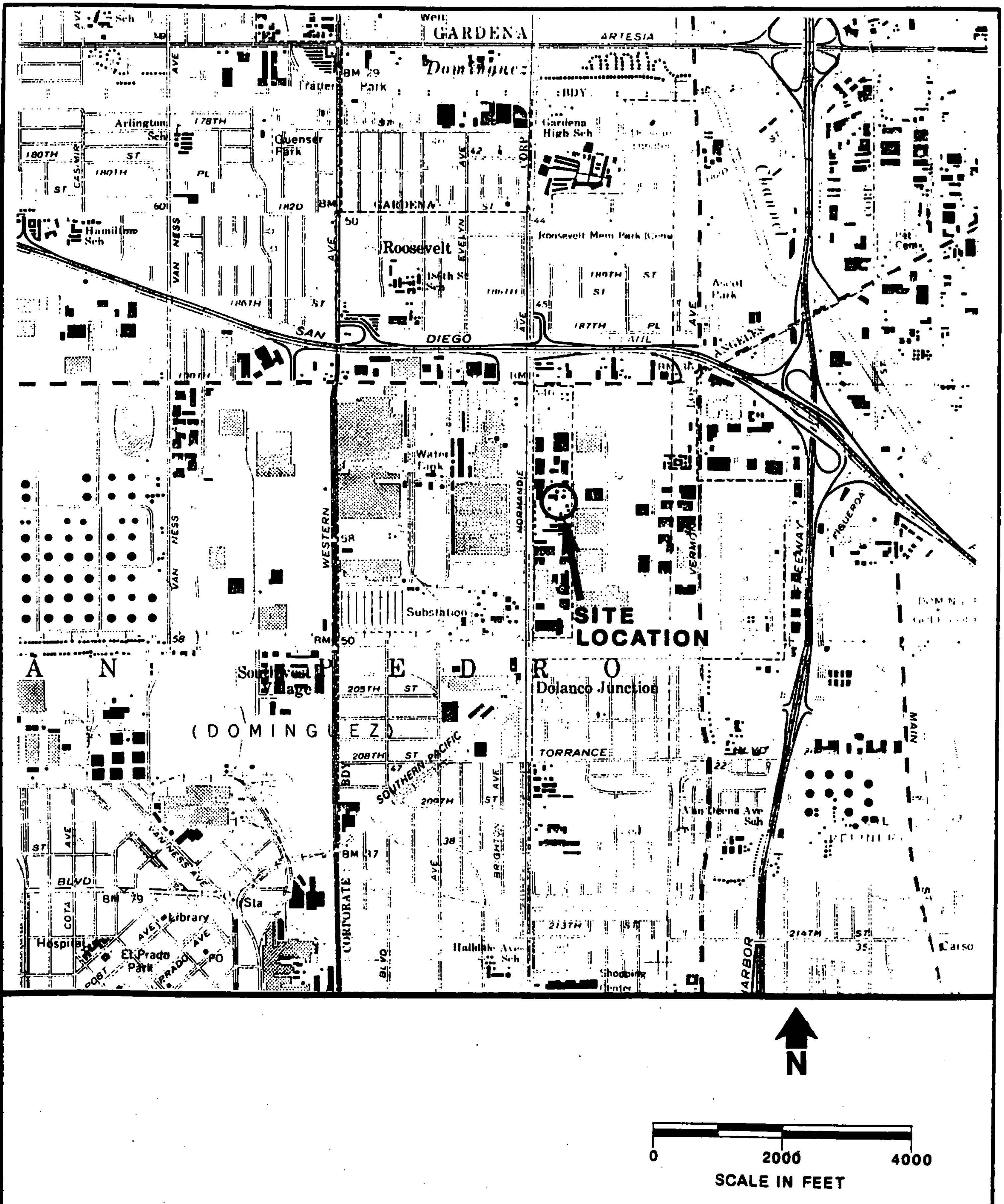
ASSESSMENT AND GROUNDWATER SAMPLING
AMOCO CHEMICAL FACILITY
TORRANCE, CALIFORNIA

1.0 INTRODUCTION

Amoco Chemical Company operates a facility at 1225 West 196th Street, Torrance, California for the conversion of styrene monomer to styrene polymer (Figure 1). Prior to remodeling tank impound areas, Amoco undertook assessment of subsurface soil within the impound area to evaluate the presence and concentration of styrene. This subsurface assessment was performed initially by Engineering Enterprises, Inc. (EEI) through the drilling of five shallow borings to depths of three to five feet below ground surface (bgs) (EEI, 1988). This initial assessment indicated the presence of styrene and ethylbenzene in shallow soil. ENSR, an environmental company, was subsequently retained to further delineate affected soil. ENSR drilled fourteen borings to reported depths of 10 to 20 feet bgs. Styrene was reported to be present in the soil sample collected from 20 feet in borings B-9 and B-13. Amoco retained EEI to drill two borings near ENSR'S borings B-9 and B-13 to depths of 40 feet bgs using a portable drilling rig. Additionally, EEI was requested to obtain groundwater samples from the six groundwater monitoring wells located onsite in two separate events. This report contains the results of the soil sampling and groundwater sampling performed by EEI.



SITE LOCATION MAP
AMOCO CHEMICAL FACILITY
TORRANCE, CALIFORNIA

EEI ENGINEERING ENTERPRISES, INC.

PROJECT NO: 512-345	FIGURE: 1
DATE: MARCH, 1990	

2.0 PURPOSE

The purpose of the soil and groundwater sampling was to evaluate the vertical extent of styrene in soil to a depth of 40 feet bgs in the area of borings B-9 and B-13 installed by ENSR. Additionally, an evaluation was to be made of volatile organic compounds in groundwater samples collected from onsite monitoring wells.

3.0 SCOPE OF WORK

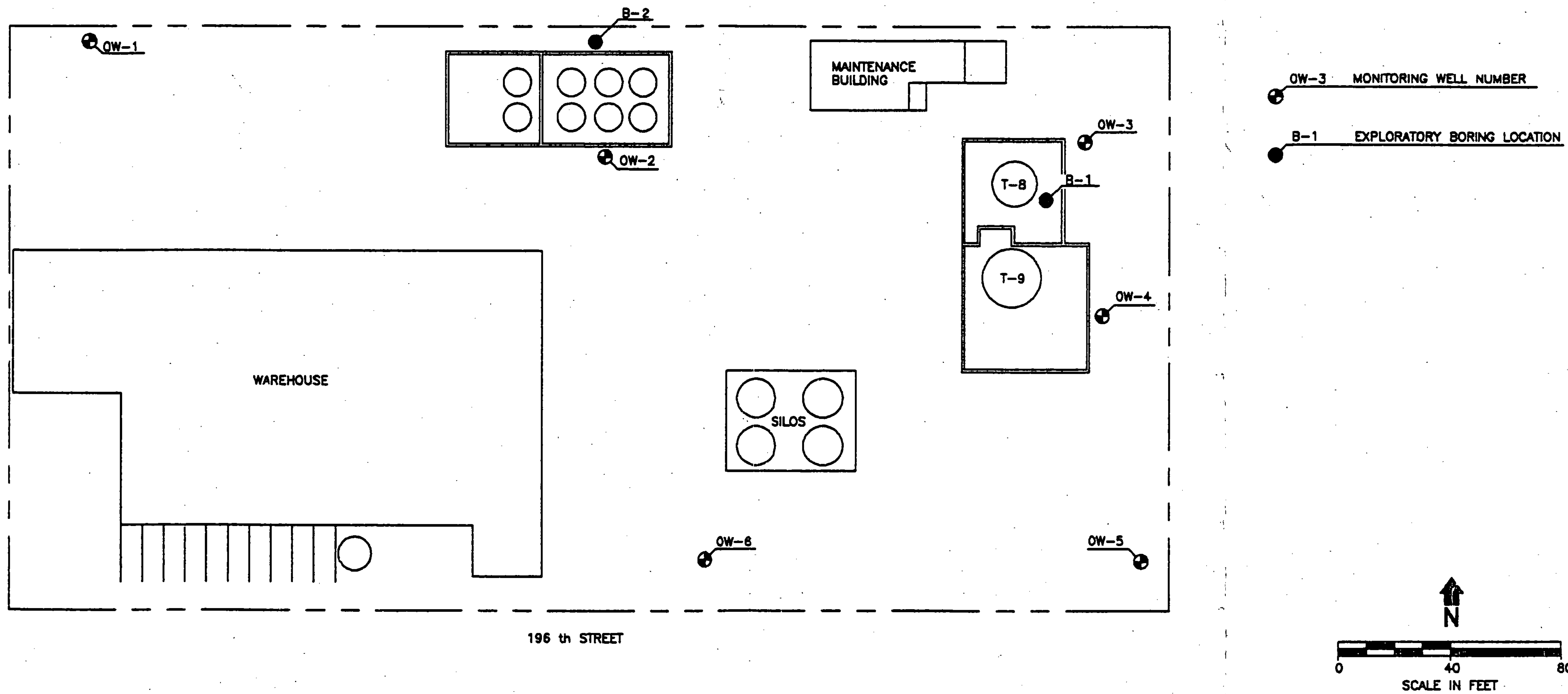
To achieve the purposes stated above, the following scope of work was performed:

- Drilled two exploratory borings near former borings B-9 and B-13;
- Collected soil samples at five-foot intervals from the exploratory borings;
- Collected groundwater samples from the six onsite groundwater monitoring wells;
- Chemically analyzed 10 soil samples using EPA method 8240;
- Chemically analyzed groundwater samples using EPA method 624; and,
- Prepared this report.

4.0 METHODOLOGY

4.1 Exploratory Borings

Two exploratory borings were installed in approximate locations depicted in Figure 2 using a skid-mounted hydraulic drive drilling rig fitted with 8-inch diameter hollow stem augers. Soil samples were collected at five-foot intervals beginning at the 20-foot



BORING AND MONITORING WELL
LOCATION MAP
1225 WEST 196th STREET
TORRANCE, CALIFORNIA

EEI ENGINEERING ENTERPRISES, INC.

PROJECT NO: 512-345	FIGURE: 2
DATE: MARCH, 1990	

depth using a California modified split barrel sampler fitted with brass sample sleeves. The sampler was driven 18 inches (or refusal) using a 30-inch drop of a 140 pound hammer. Hammer blow counts, which provide a measurement of the relative density of soil, were recorded in six-inch intervals over the 18-inch sampling interval. For reporting purposes, the last two blow counts have been added together and presented as blows per foot.

Following retrieval of the sampler, the soils contained therein were monitored for organic vapors using a photoionization detector and flame ionization detector. The procedure for organic vapor monitoring is contained in Appendix A. Subsequent to vapor screening, the sleeve corresponding to the lowest six inches of the sampled interval was removed, the ends covered with Teflon sheeting and plastic caps and sealed with PVC tape. A label was then affixed to each sealed sample sleeve which contained the following information: sample number, boring number, depth, job numberings, date and collector's name. Sealed and labeled samples were then placed in an ice chest containing blue ice for transport to the analytical laboratory. Chain-of-custody forms were completed in the field and accompanied the samples to the analytical laboratory.

Drilling was conducted under the observation of an EEI geologist who is directly supervised by a California Registered Geologist. The EEI geologist logged soils in accordance with the Unified Soil

Classification System and maintained detailed logs of subsurface soil and organic vapor concentrations encountered. Boring logs are contained in Appendix B.

All downhole drilling equipment was steam cleaned before use to reduce the potential for cross-hole contamination. Samplers were washed in a dilute solution of trisodium phosphate, rinsed in fresh, followed by distilled water and dried between samples. Drill cuttings were collected in DOT-approved 17-H drums, sealed, labeled and are stored onsite pending disposal. Borings were backfilled immediately upon completion using bentonite clay.

4.2 Groundwater Sampling

Groundwater sampling was conducted on the six groundwater monitoring wells located onsite (Figure 2). Prior to sampling, wells were gauged to identify depth of water, (which varied from about 63 to 66 bgs), depth of well and volume of water within the well bore. Wells were then purged of at least five well volumes of water. Measurements of temperature, electrical conductivity and pH were taken during the purging process. When five well volumes of water had been purged and three consecutive readings had stabilized to within ten percent of one another, groundwater samples were collected for laboratory analysis.

Groundwater samples were collected using disposable Teflon bailers fitted with controlled flow emptying devices. Samples were

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May, 1990

collected into laboratory clean glass vials having lids with Teflon lined septa and containing hydrochloric acid as a preservative. Samples were transferred from the bailer to the vials using the submerged fill technique. Lids were replaced on the vials and the vials were inverted and visually checked for the presence of air bubbles. Samples containing air were uncapped, refilled and rechecked. Samples not containing air had labels affixed which contained the following information: date, sampler's initials, job number, well number, sample number and requested analyses. Appropriately sealed and labeled samples were then placed in an ice chest containing frozen blue-ice for transport to the analytical laboratory. Chain-of-custody forms were completed in the field and accompanied the samples to the laboratory. Bailers were discarded after use at each well.

A second groundwater sampling event was conducted in a manner identical to the first with the following additions: 1) a field blank was collected by pouring distilled water into a clean bailer and then decanting the water into sample vials, and 2) a trip blank was provided by the laboratory and accompanied the sample vials during the sampling event.

4.3 Chemical Analyses

Soil samples collected from the exploratory borings were analyzed using EPA method 8240 for volatile organic compounds. Groundwater samples were analyzed using EPA method 624 for purgeable compounds.

5.0 DISCUSSION OF RESULTS

No detectable concentrations of analyzed compounds were reported in soil samples collected from boring B-1. Soil samples from boring B-2 did not contain detectable concentrations of analyzed compounds at depths of 20 and 25 feet bgs. The soil sample collected from 30 feet contained carbon disulfide at a reported concentration of 0.14 milligrams per kilogram (mg/kg) and trichloroethene at a reported concentration of 0.11 mg/kg. The soil sample collected from a depth of 35 feet bgs contained reported concentrations of carbon disulfide at 0.06 mg/kg, trichloroethene at 0.86 mg/kg, and benzene at 0.05 mg/kg. The soil sample collected from a depth of 40 feet bgs contained reported concentrations of trichloroethene at 0.15 mg/kg, tetrachloroethene at 0.2 mg/kg and 1,1,1 trichloroethane at 0.07 mg/kg. Presented in Table 1 are laboratory results for soil samples from boring B-2. Laboratory reports for soil samples are contained in Appendix C, Part 1.

TABLE 1

LABORATORY RESULTS - BORING B-2(a)

Depth (ft.)	Benzene	Carbon Disulfide	TCE(b)	PCE(c)	1,1,1-TCA(d)
20	ND(0.05)	ND(.05)(e)	ND(0.05)	ND(0.05)	ND(0.05)
25	ND(0.05)	ND(.05)	ND(0.05)	ND(0.05)	ND(0.05)
30	ND(0.05)	0.14	0.11	ND(0.05)	ND(0.05)
35	0.05	0.06	0.86	ND(0.05)	ND(0.05)
40	ND(0.05)	ND(0.05)	0.15	0.20	0.07

(a) All concentrations reported in milligrams per kilogram.
(b) TCE = Trichloroethene.
(c) PCE = Tetrachloroethene.
(d) TCA = Trichloroethane.
(e) ND = Not detected above concentration in parentheses.

Groundwater samples collected 2-1-90 from all six wells all contained detectable concentrations of trichloroethene (TCE) ranging from 500 to 5,800 micrograms per liter (ug/L). Tetrachloroethene (PCE) was detected in wells OW-2 to OW-6 in the concentration range from 50 ug/L to 1,600 ug/L. PCE was not detected in OW-1 above a detection limit of 80 ug/L. The compounds 1,1-dichloroethene and 1,2-dichloroethene (total) were detected in wells OW-4, OW-5 and OW-6 in reported concentrations ranging from 17 ug/L to 200 ug/L. Of these two compounds, only 1,2-dichloroethene was detected in OW-3 at a concentration of 54 ug/L. Neither compound was reported to be present in groundwater samples from wells OW-1 and OW-2 above detection limits of 80 ug/L and 4 ug/L, respectively. Methylene chloride was reported only in the water sample collected from well OW-1 at a concentration of 10,000 ug/L. Presented in Table 2 are the reported concentrations for detected compounds. Appendix C, Part 2, contains the laboratory reports from the first groundwater analytical event. A relative groundwater elevation contour map for this sampling event is presented in Figure 3. Concentration maps for PCE, TCE and 1,2-dichloroethene are presented in Figures 4, 5 and 6, respectively.

TABLE 2

LABORATORY RESULTS - GROUNDWATER SAMPLING
DATE 2-1-90(a)

Compound	Monitoring Well No.						
	OW-1	OW-2	OW-22 (Duplicate of OW-2)	OW-3	OW-4	OW-5	OW-6
1,1-DCE(b)	ND80(c)	ND4	ND5	ND15	17	63	21
1,2 DCE (Total)	ND80	ND4	ND5	54	64	200	21
Methylene Chloride	10000	ND20	ND25	ND75	ND50	ND200	ND75
TCE(d)	1000	500	625	1700	1400	5800	1900
PCE(e)	ND80	50	68	240	310	1600	780

(a) Concentrations in micrograms per liter.
(b) DCE = Dichloroethene.
(c) ND = Not detected above concentration shown.
(d) TCE = Trichloroethene.
(e) PCE = Tetrachloroethene.

VOF
1050-00011

ENGINEERING ENTERPRISES, INC.

WATER RESOURCES SPECIALISTS

6695 E. Pacific Coast Highway Long Beach, CA 90803 213-430-6500

May 29, 1990

Amoco Chemical Company
1225 West 196th Street
Torrance, California 90502

Attention: Mr. Jeff Campbell
Process Engineer

Subject: Report of Additional Subsurface Assessment and Groundwater Sampling
Amoco Chemical Facility
1225 West 196th Street
Torrance, California
Project No. 512-345

Dear Mr. Campbell:

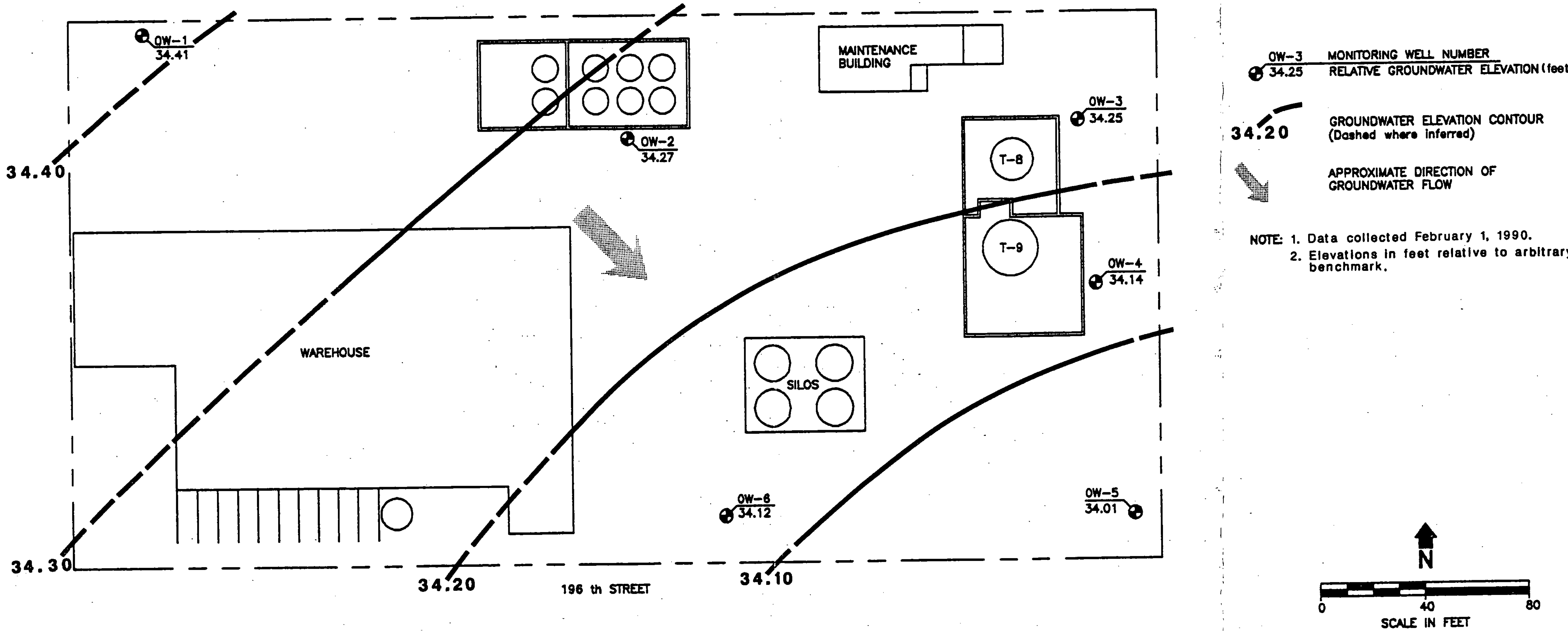
Presented herewith is the report of subsurface assessment and groundwater sampling performed by Engineering Enterprises, Inc. (EEI). This assessment was performed at the request of Amoco, Inc. to evaluate the presence of styrene, ethylbenzene and associated chemicals in two boreholes and six groundwater monitoring wells at the subject site.

We trust this report meets your current requirements. Should you have questions regarding the results contained herein, or require further clarification, please contact us. We appreciate the opportunity to be of continued service to Amoco.

Respectfully,

William E. Halbert
Project Hydrogeologist

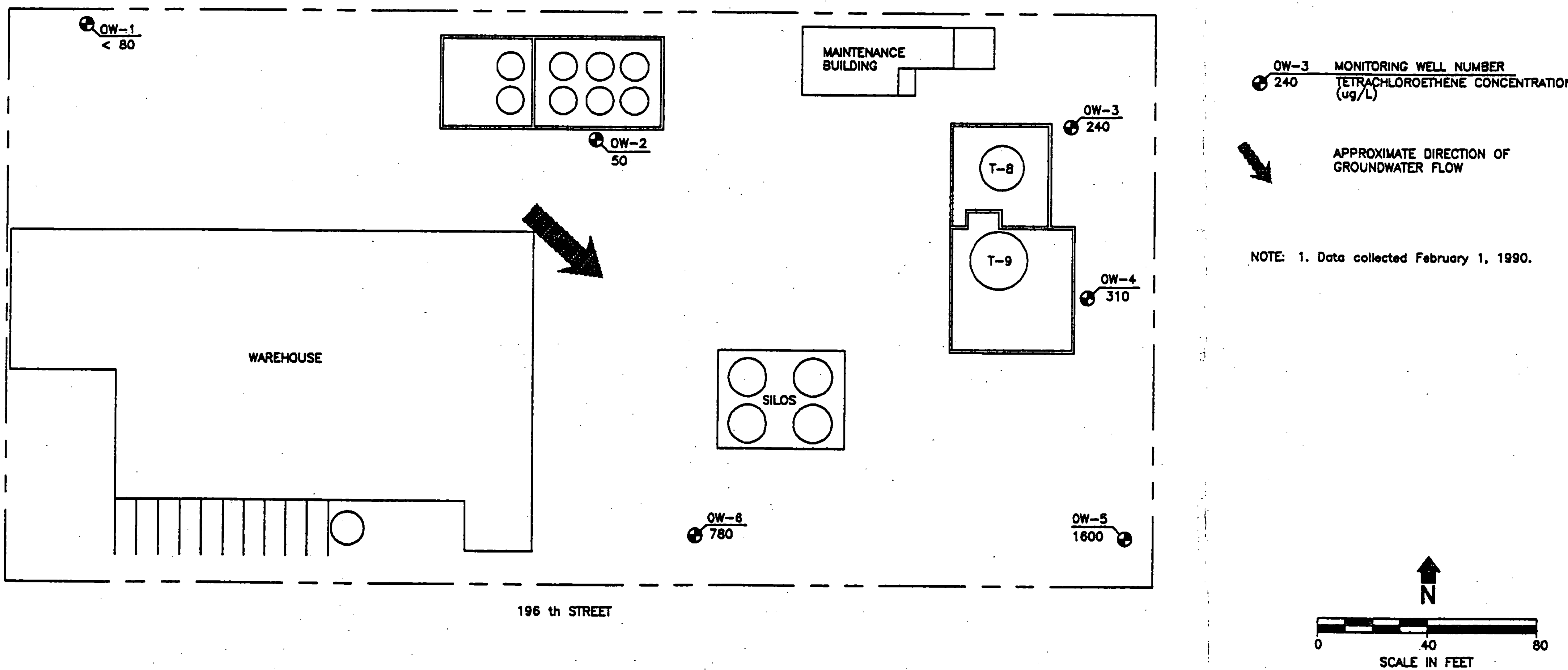
WEH:weh



RELATIVE GROUNDWATER ELEVATION CONTOUR MAP
1225 WEST 196th STREET
TORRANCE, CALIFORNIA

EEI ENGINEERING ENTERPRISES, INC.

PROJECT NO: 512-345	FIGURE: 3
DATE: MARCH, 1990	



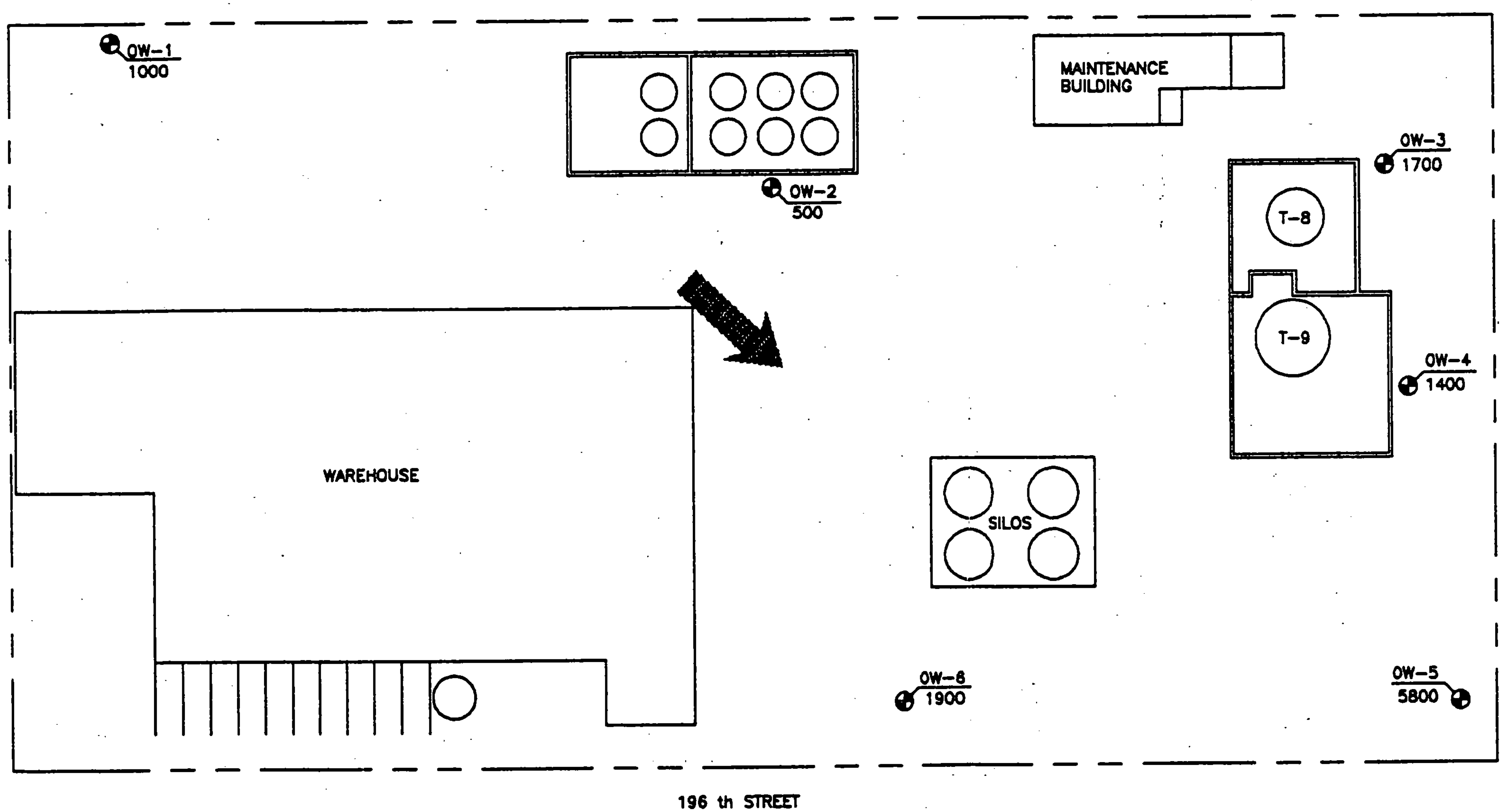
TETRACHLOROETHENE CONCENTRATION MAP

1225 WEST 196th STREET

TORRANCE, CALIFORNIA

EEI ENGINEERING ENTERPRISES, INC.

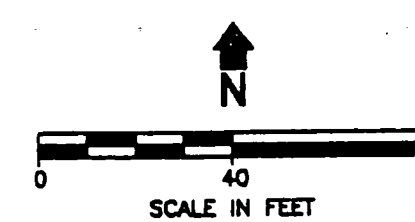
PROJECT NO: 512-345	FIGURE: 4
DATE: MARCH, 1990	



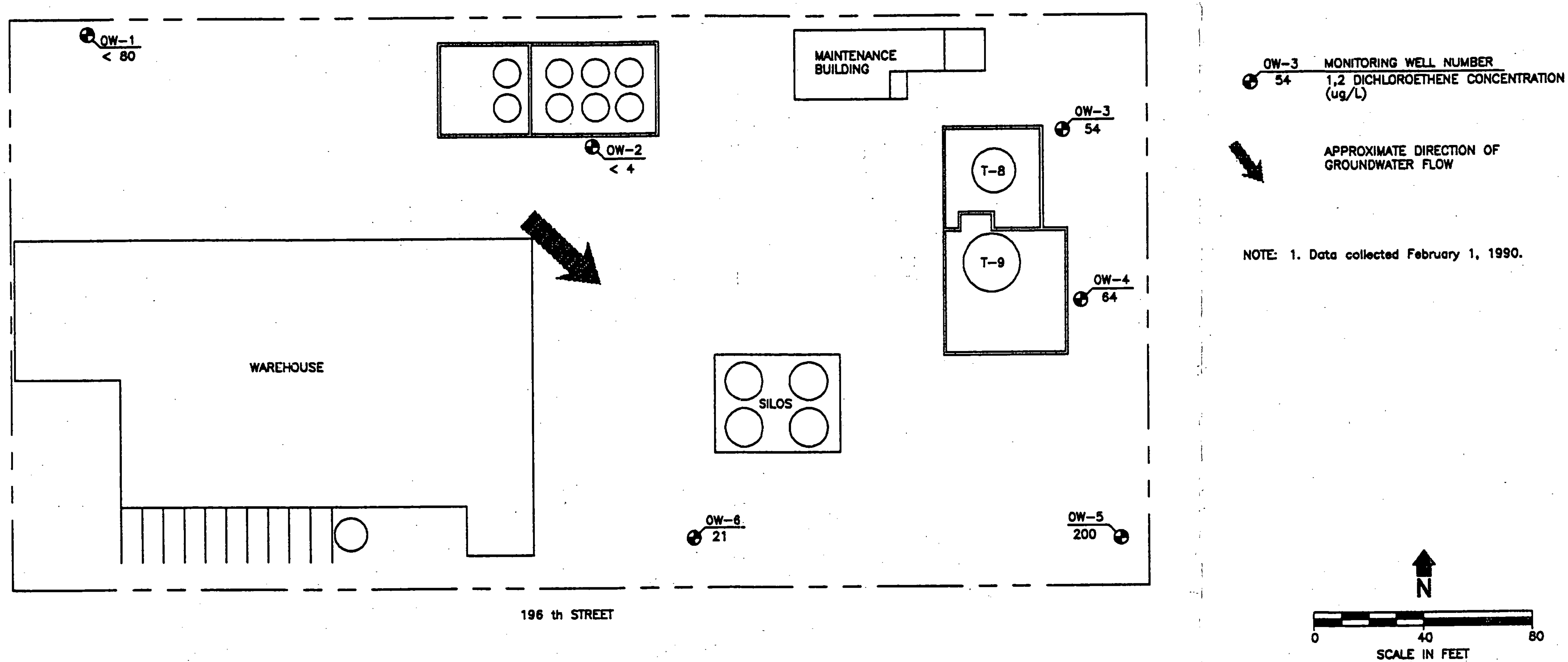
OW-3 MONITORING WELL NUMBER
1700 TRICHLOROETHENE CONCENTRATION (ug/L)

APPROXIMATE DIRECTION OF GROUNDWATER FLOW

NOTE: 1. Data collected February 1, 1990.



TRICHLOROETHENE CONCENTRATION MAP 1225 WEST 196th STREET TORRANCE, CALIFORNIA	
EEI ENGINEERING ENTERPRISES, INC.	
PROJECT NO: 512-345	FIGURE: 5
DATE: MARCH, 1990	



1,2 DICHLOROETHENE CONCENTRATION MAP
1225 WEST 196th STREET
TORRANCE, CALIFORNIA

EEI ENGINEERING ENTERPRISES, INC.

PROJECT NO: 512-345
FIGURE: 6
DATE: MARCH, 1990

Groundwater samples were collected during a second sampling event (2-21-90) to confirm detections reported in the first event (2-1-90). In general, reported concentrations from the second sampling and analytical event were at least twice the concentrations reported from the first event. Compounds detected in the second sampling event but not the first include chlorobenzene and total xylenes at 2,800 ug/L and 210 ug/L respectively in the sample from well OW-6. Reported concentrations from the second sampling event are presented in Table 3, below. A relative groundwater elevation contour map for the second sampling event is presented in Figure 7. Concentration maps for PCE, TCE and 1,2-dichloroethene are presented in Figures 8, 9 and 10, respectively. Laboratory reports are contained in Appendix C, Part 3.

TABLE 3

LABORATORY RESULTS - GROUNDWATER SAMPLING
DATE 2-21-90(a)

Compound	Monitoring Well No.						
	OW-1	OW-2	OW-3	OW-4	OW-5	OW-22 (Duplicate of OW-5)	OW-6
Methylene Chloride	190000	ND25(b)	ND100	ND75	ND400	ND500	ND200
1,1-DCE(c)	ND1500	ND5	35	ND15	130	100	56
1,2-DCE (Total)	ND1500	6	150	87	380	380	59
TCE(d)	2200	1100	3800	3400	15000	16000	7800
PCE(e)	ND1500	160	1100	400	5900	5100	3300
Chlorobenzene	ND1500	ND5	ND20	ND15	ND80	ND100	2800
Xylenes	ND1500	ND5	ND20	ND15	ND80	ND100	210

(a) Concentrations reported in micrograms per liter.
(b) ND = Not detected above concentration shown.
(c) DCE = Dichloroethene.
(d) TCE = Trichloroethene.
(e) PCE = Tetrachloroethene.

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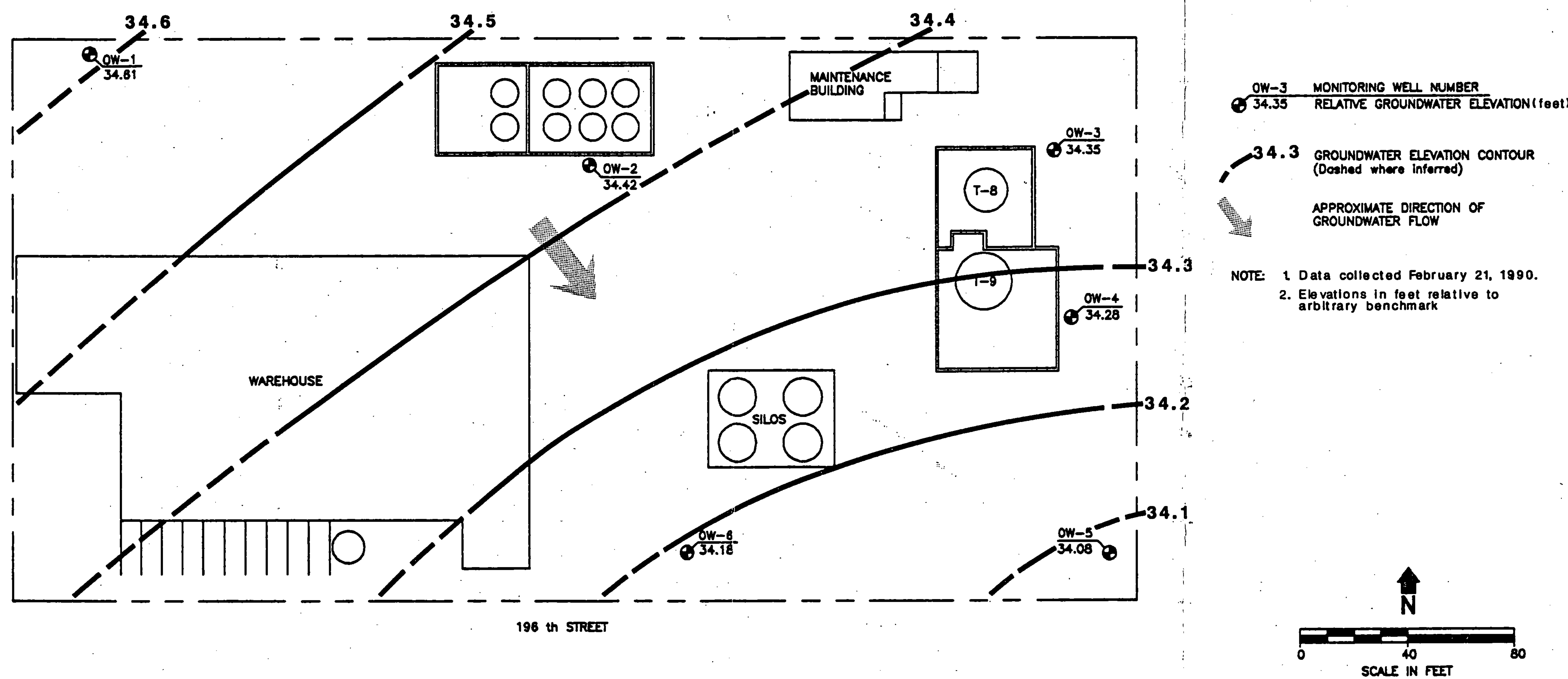
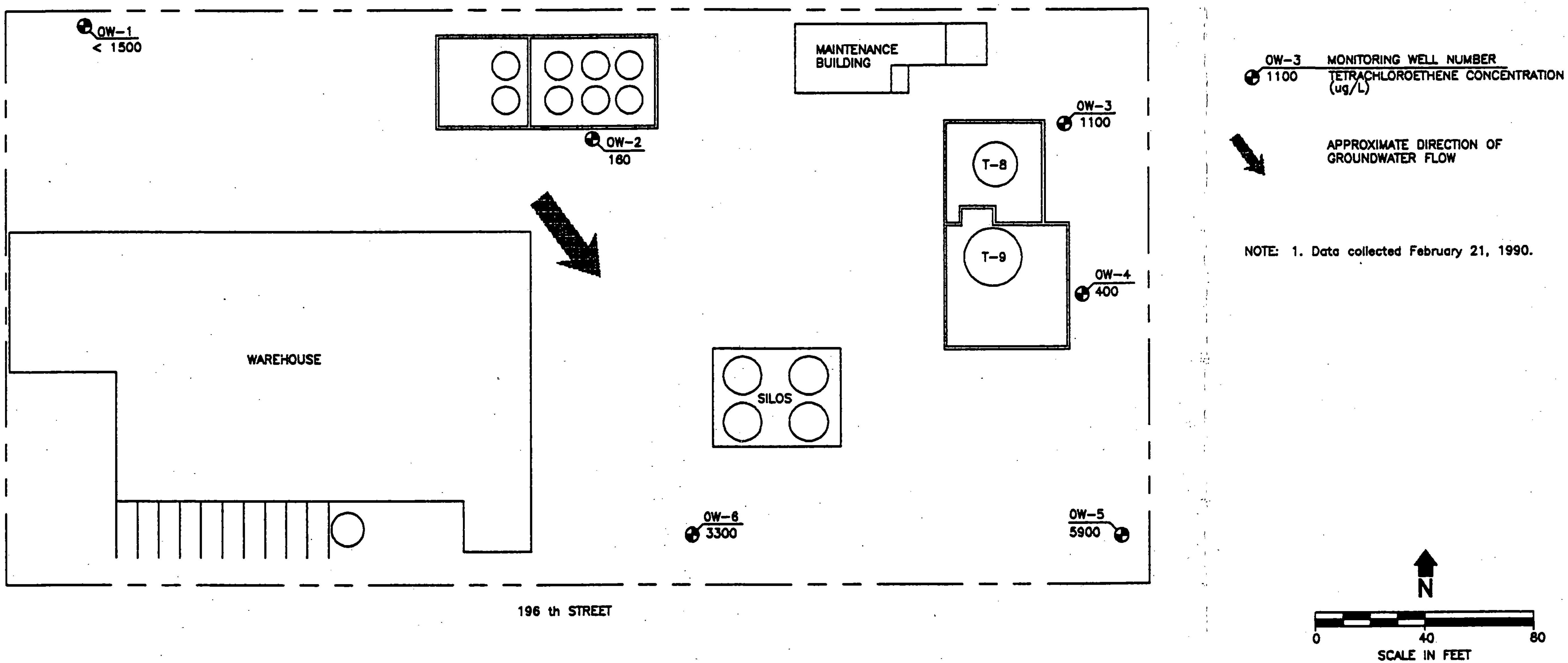


NOTE: 1. Data collected February 21, 1990.
2. Elevations in feet relative to arbitrary benchmark

RELATIVE GROUNDWATER ELEVATION CONTOUR MAP
1225 WEST 196th STREET
TORRANCE, CALIFORNIA

EEI ENGINEERING ENTERPRISES, INC.

PROJECT NO: 512-345	FIGURE: 7
DATE: MARCH, 1990	



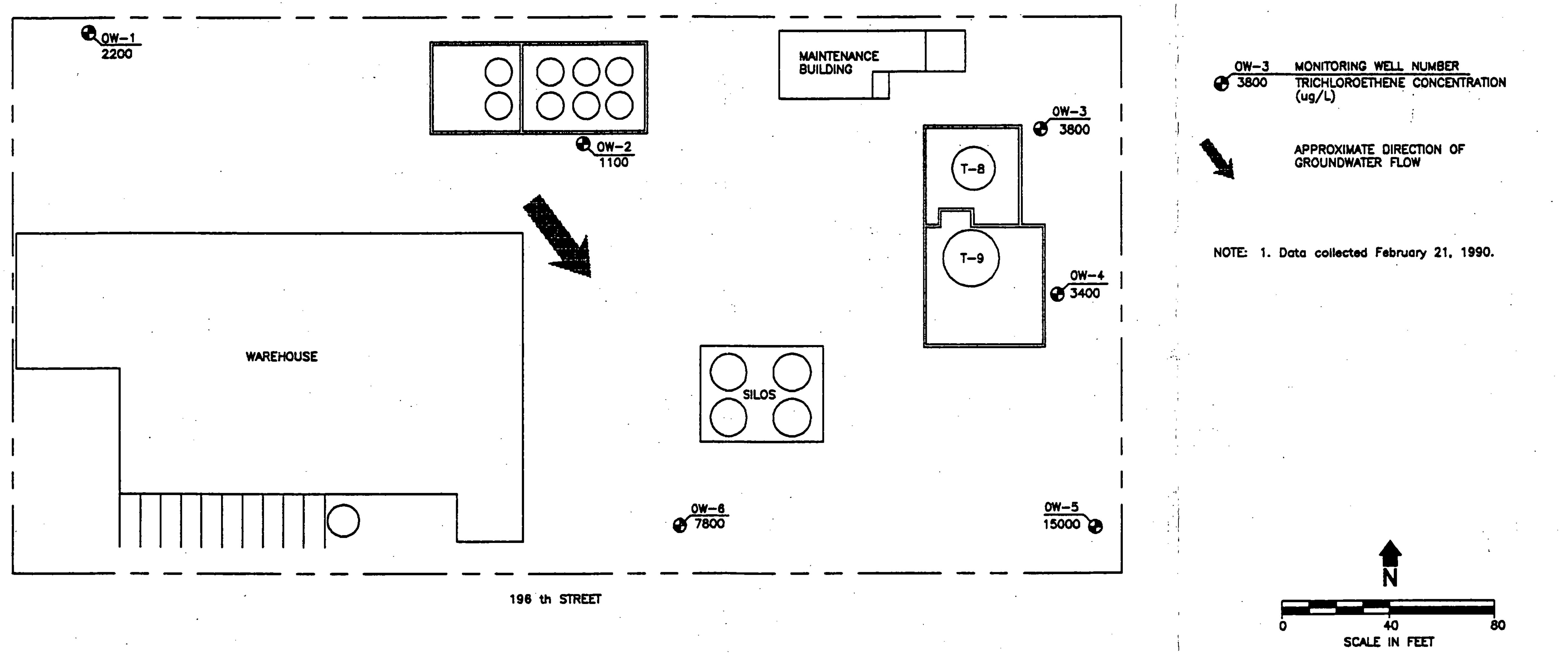
TETRACHLOROETHENE CONCENTRATION MAP

1225 WEST 196th STREET

TORRANCE, CALIFORNIA

EEI ENGINEERING ENTERPRISES, INC.

PROJECT NO: 512-345	FIGURE: 8
DATE: MARCH, 1990	



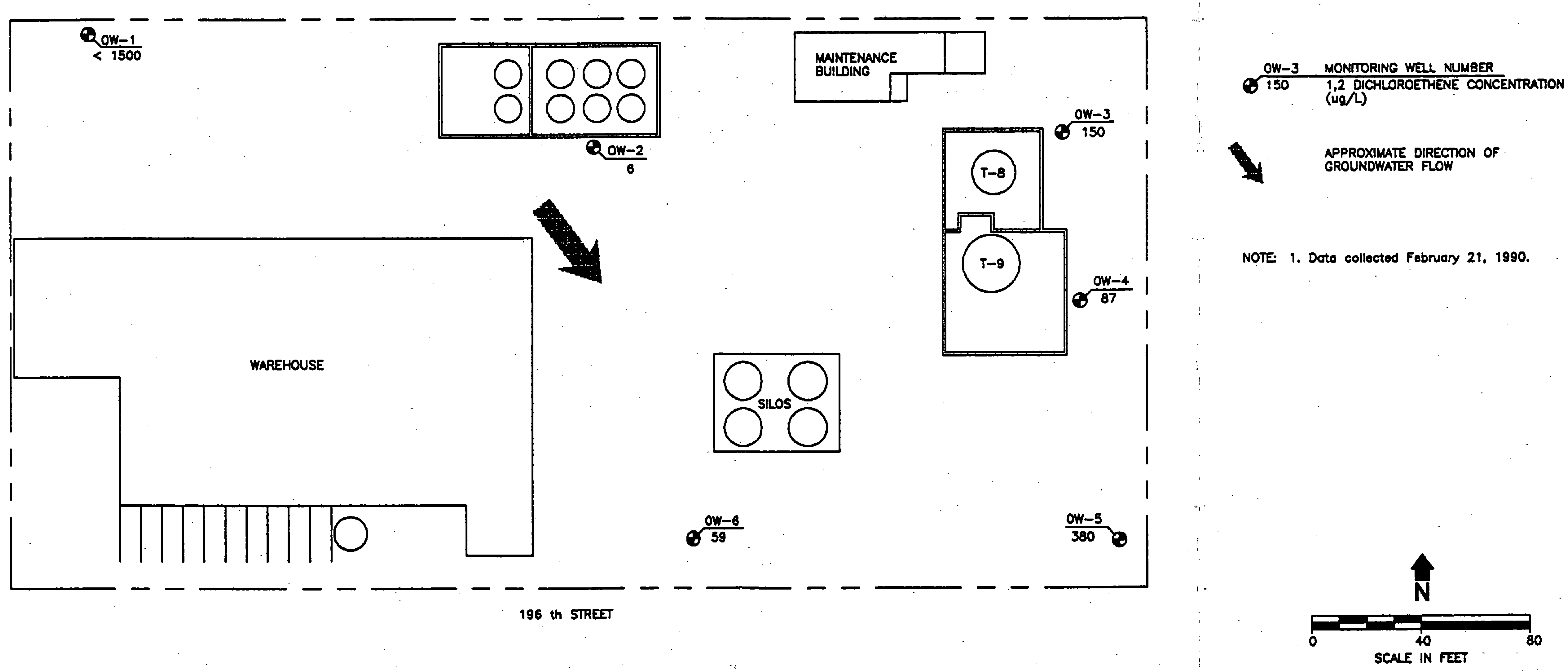
TRICHLOROETHENE CONCENTRATION MAP

1225 WEST 196th STREET

TORRANCE, CALIFORNIA

EEI ENGINEERING ENTERPRISES, INC.

PROJECT NO: 512-345	FIGURE: 9
DATE: MARCH, 1990	



1,2 DICHLOROETHENE CONCENTRATION MAP

1225 WEST 196th STREET

TORRANCE, CALIFORNIA

EEI ENGINEERING ENTERPRISES, INC.

PROJECT NO: 512-345

FIGURE: 10

DATE: MARCH, 1990

6.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the analytical results presented above, the following conclusions are made:

- First groundwater at the site occurs under unconfined conditions at a depth of about 63 to 66 feet below ground surface with a flow direction to the southeast having a gradient varying from about 0.001 to 0.0015.
- Groundwater at the site contains detectable concentrations of purgeable compounds, specifically methylene chloride, 1,1- and 1,2-dichloroethane, TCE, PCE, chlorobenzene and total xylenes.
- Concentrations of the above chemicals increase in a downgradient direction.
- No detectable concentrations of styrene or ethylbenzene were reported to be present in analyzed soil samples from borings B-1 and B-2.
- Detectable concentrations of TCE, PCE, carbon disulfide, benzene and/or 1,1,1-trichloroethane were present in soil samples collected at or below the 30-foot sampling interval in boring B-2.
- Based on communication with Amoco employees, TCE, PCE, carbon disulfide, benzene and xylene have never been used in the processes onsite.
- Soil and groundwater appear to be affected by an offsite source due to the lack of historical data indicating use of detected compounds on the property.

Based on the conclusions presented above, the following recommendation is offered:

- Biannual sampling of groundwater monitoring wells to monitor chemical concentrations.

7.0 LIMITATIONS

The conclusions and recommendations presented above are based upon:

- o Observations and vapor readings collected during the drilling of two exploratory borings and sampling of six groundwater monitoring wells;
- o Results of laboratory analyses conducted on soil and groundwater samples by Analytical Technologies, Inc. of San Diego, California; and
- o Review of portions of previous consultant's reports supplied by Amoco.

It is possible that variations in soil and groundwater conditions exist beyond the points explored in this assessment. Also, changes in groundwater conditions may occur at some future time due to fluctuations in rainfall, regional water uses, or other factors.

Engineering Enterprises, Inc. warrants their services provided in conjunction with this assessment were performed in a manner consistent with a level of care and skill ordinarily exercised by members of our profession currently practicing in the Los Angeles County area. No other warranty, expressed or implied, is made.

8.0 REFERENCES

Engineering Enterprises, Inc., 1988, Report of Shallow Soil Sampling, Amoco Chemical Facility, Torrance, California.

APPENDIX A

SOIL SAMPLE VAPOR SCREENING METHODOLOGY

APPENDIX A

SOIL SAMPLE VAPOR SCREENING METHODOLOGY

Presented below is the basic methodology for field screening of soil sample vapor. The screening is performed using an HNU Model P101 and/or Photo-Vac tip portable photoionization detector (PID) or a Foxboro OVA Flame Ionization Detector (FID). These detectors provide a non-discriminatory indication of the presence of a variety of organic compounds and can be used for relative quantification of organic compound presence. With this capability, the detectors serve as useful tools in the screening of soil samples in the field. The basic method for field screening of a soil sample with the detector is as follows:

1) The soil sample is removed from the sample tube or tip of the sampler and approximately one cubic inch is placed in a sealable polyethylene bag with a capacity of approximately 500 milliliters.

2) The sample is crushed through the walls of the bag to provide greater surface area for vapor outgassing.

3) Outgassing of the sample is allowed for approximately five minutes at ambient air temperature.

4) The bag is then pierced with the probe of the analyzer and the vapors are drawn out of the bag using the analyzer pump.

5) Readings are noted from the initial insertion to when the bag is collapsed. The sustained value for the reading is recorded unless there is moisture interference. In this case, the initial high reading is recorded before moisture interferences causes the reading to diminish.

6) If soil or excessive moisture is drawn into the instrument, the sample probe is thoroughly cleaned and air is passed through the system until the zero or background level is attained.

7) Readings are tabulated with the boring number and depth of the sample noted on the field log which is maintained by the on-site geologist.

APPENDIX B

BORING LOGS

BORING: EEI-1	FILE NAME: EEI1

PROJECT NAME: AMOCO	PROJECT NO. 512-345
LOCATION/COORDINATES: East of Tank No. T-8	RIG TYPE: Soil Master

SCHEDULE	WATER LEVEL	
		SAMPLING METHOD: SS
INITIATED: 2-15-90	DEPTH: NA	DRILLING CO: West Hazmat Drilling Corp.
COMPLETED: 2-15-90	DATE: NA	
BACKFILLED: 2-15-90	TIME: NA	DRILLED BY: M.Smith
		LOGGED BY: B.Charest
GROUND ELEVATION: --	BORING DEPTH: 40'	SHEET 1 OF 2

DEPTH IN FEET	SAMPLE NUMBER	DEPTH	TYPE	BLOWS	PID ppm	OVA ppm	USCS	SYMBOL	SOIL DESCRIPTION	REMARKS
0					180	110			Cemented gravel to 1" diameter	
							CL		SILTY CLAY: Dark brown (10YR-2/2); slightly moist	
									yellowish brown (10YR-5/6); slightly moist	
5					40	28				
10					60	33				
15					64	44				
					0	0	SP		SAND: Light olive brown (2.5Y-5/4); fine little silt; trace coarse; slightly moist	
20	S-1-20		SS	33	13	5.8	CL		SILTY CLAY: Light olive brown (2.5YR-5/4) slightly moist	

Denotes Laboratory Sample

EEI ENGINEERING ENTERPRISES, INC.

DEPTH IN FEET	SAMPLE NUMBER	DEPTH	TYPE	BLOWS	PID ppm		USCS	SYMBOL	SOIL DESCRIPTION	REMARKS
25	1-2-25		SH	28	3		ML		CLAYEY SILT: Light olive brown (2.5Y-5/4); some clay; slightly moist; very stiff	
30	1-3-30		SH	58	8		SP		SAND: Light olive brown (2.5Y-5/4); poorly graded; fine to medium; micaceous; trace silt; moist; very dense	
35	1-4-35		SH	24	4		ML		CLAYEY SILT: Light yellowish brown (2.5Y-6/4); little clay; trace fine sand; slightly moist; very stiff	
40	1-5-40		SH	44	2		SM		SILTY SAND: Light yellowish brown (2.5Y-5/4); poorly graded; fine; little silt; moist; hard	
45										
50										

BORING: B-2		FILE NAME: B2
PROJECT NAME: AMOCO TORRANCE		PROJECT NO. 512-350
LOCATION/COORDINATES:		RIG TYPE: Soil Master
SCHEDULE	**WATER LEVEL**	SAMPLING METHOD: SH
INITIATED: 2-15-90	DEPTH: NA	DRILLING CO: West Hazmat
COMPLETED: 2-15-90	DATE: NA	DRILLED BY: M.Smith
BACKFILLED: 2-15-90	TIME: NA	LOGGED BY: T.Danaher
GROUND ELEVATION: NA	BORING DEPTH: 40'	SHEET 1 OF 2

DEPTH IN FEET	SAMPLE DATA: SAMPLE NUMBER	DEPTH	TYPE	BLOWS	PID ppm		SOIL TYPE: USCS	SYMBOL	SOIL DESCRIPTION	REMARKS
0										
5	GS1-1-5		GS	NA	5		CL		CLAY: Dark greyish brown (10YR-4/2); little silt; trace fine sand; moist; medium stiff	
10	GS1-2-10		GS	NA	5				dark greyish brown (10YR-5/3); stiff	
15	GS1-3-15		GS	NA	3				dark yellowish brown (10YR-4/3); trace coarse sand	
							SM		SILTY SAND: Very dark greyish brown; graded; fine; little silt; little clay; moist; medium dense (est.)	
20	1-1-20		SS	29	0		SP		SAND: Light yellowish brown (2.5Y-6/4); poorly graded; fine; trace silt; moist; medium dense	

EEI ENGINEERING ENTERPRISES, INC.

BORING: EEI-1 **Cont.** **FILE NAME: EEI1-2**

DEPTH IN FEET	SAMPLE NUMBER	DEPTH	TYPE	BLOWS	PID ppm	OVA ppm	USCS	SOIL DESCRIPTION	REMARKS
25	S-1-25		SS	29	20	50	SM	SILTY SAND: Light olive brown (2.5YR-5/4); poorly sorted; slightly moist; trace mica	
30	S-1-30		SS	35	14	5.4	SP	SAND: Light olive brown (2.5YR-5/4); fine to coarse; poorly sorted; slightly moist; micaceous	
35	S-1-35		SS	47	5	1.6	ML	SILT: Light olive brown (2.5YR-5/4); clayey very fine sandy; low moisture; micaceous	
40	S-1-40		SS	47	3.5	2.6	SP	SAND: Pale yellow (5Y-7/3); silty very fine to fine; poorly sorted; slightly moist; trace mica	
45									
50									

Denotes Laboratory Sample

EEI ENGINEERING ENTERPRISES, INC.

APPENDIX C

LABORATORY REPORTS

APPENDIX C

PART I

LABORATORY REPORTS - SOIL

AnalyticalTechnologies,Inc. Corporate Offices: 5550 Morehouse Drive San Diego, CA 92121 (619) 458-9141

ATI I.D. 002220

February 22, 1990

Engineering Enterprises, Inc.
6695 East Pacific Coast Highway
Long Beach, California 90803

Project No.: 512-345

Attention: Tom Danaher

On February 16, 1990, Analytical Technologies, Inc. received ten soil samples for analysis. The samples were analyzed with EPA methodology or equivalent methods as specified in the attached analytical schedule. The symbol for "less than" indicates a value below the reportable detection limit. Please see the attached sheet for the sample cross reference.

The results of this analysis and the quality control data are enclosed.

Carolyn A. Sites
Carolyn A. Sites
GC/MS Supervisor

Richard M. Amano
Laboratory Manager

CAS:em

Analytical**Technologies,**Inc.

ATI I.D. 002220

ANALYTICAL SCHEDULE

CLIENT: ENGINEERING ENTERPRISES, INC.
PROJECT NAME: (NONE)

PROJECT NO.: 512-345

ANALYSIS	TECHNIQUE	REFERENCE/METHOD
VOLATILE ORGANICS	GC/MS	EPA 8240

Analytical**Technologies**,Inc.

CLIENT : ENGINEERING ENTERPRISES-LONG BEACH   DATE RECEIVED : 02/16/90
PROJECT # : 512-345
PROJECT NAME : (NONE)   REPORT DATE : 02/22/90

ATI I.D. : 002220

ATI #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	1-1-20	SOIL	02/15/90
02	1-2-25	SOIL	02/15/90
03	1-3-30	SOIL	02/15/90
04	1-4-35	SOIL	02/15/90
05	1-5-40	SOIL	02/15/90
06	2-1-20	SOIL	02/15/90
07	2-2-25	SOIL	02/15/90
08	2-3-30	SOIL	02/15/90
09	2-4-35	SOIL	02/15/90
10	2-5-40	SOIL	02/15/90

----- TOTALS -----

MATRIX	# SAMPLES
SOIL	10

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.

AnalyticalTechnologies,Inc.

GCMS - RESULTS

ATI I.D. : 00222001

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

CLIENT	: ENGINEERING ENTERPRISES-LONG BEACH	DATE SAMPLED	: 02/15/90
PROJECT #	: 512-345	DATE RECEIVED	: 02/16/90
PROJECT NAME	: (NONE)	DATE EXTRACTED	: 02/19/90
CLIENT I.D.	: 1-1-20	DATE ANALYZED	: 02/19/90
SAMPLE MATRIX	: SOIL	UNITS	: MG/KG
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROMETHANE	<0.50
BROMOMETHANE	<0.50
VINYL CHLORIDE	<0.05
CHLOROETHANE	<0.05
METHYLENE CHLORIDE	<0.3
ACETONE	<1.0
CARBON DISULFIDE	<0.05
1,1-DICHLOROETHENE	<0.05
1,1-DICHLOROETHANE	<0.05
1,2-DICHLOROETHENE (TOTAL)	<0.05
CHLOROFORM	<0.05
1,2-DICHLOROETHANE	<0.05
2-BUTANONE (MEK)	<1.0
1,1,1-TRICHLOROETHANE	<0.05
CARBON TETRACHLORIDE	<0.05
VINYL ACETATE	<0.50
BROMODICHLOROMETHANE	<0.05
1,1,2,2-TETRACHLOROETHANE	<0.05
1,2-DICHLOROPROPANE	<0.05
TRANS-1,3-DICHLOROPROPENE	<0.05
TRICHLOROETHENE	<0.05
DIBROMOCHLOROMETHANE	<0.05
1,1,2 TRICHLOROETHANE	<0.05
BENZENE	<0.05
CIS-1,3-DICHLOROPROPENE	<0.05
BROMOFORM	<0.3
2-HEXANONE (MBK)	<0.50
4-METHYL-2-PENTANONE (MIBK)	<0.50
TETRACHLOROETHENE	<0.05
TOLUENE	<0.10
CHLOROBENZENE	<0.05
ETHYL BENZENE	<0.05
STYRENE	<0.05
TOTAL XYLENES	<0.05

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	81
BFB (%)	89
TOLUENE-D8 (%)	89

Analytical**Technologies**, Inc. ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

ATI I.D. : 00222001

MATRIX : SOIL

UNITS : MG/KG

COMPOUNDS	RESULTS
NONE DETECTED	N/A

AnalyticalTechnologies,Inc.

GCMS - RESULTS

ATI I.D. : 00222002

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

CLIENT	: ENGINEERING ENTERPRISES-LONG BEACH	DATE SAMPLED	: 02/15/90
PROJECT #	: 512-345	DATE RECEIVED	: 02/16/90
PROJECT NAME	: (NONE)	DATE EXTRACTED	: 02/19/90
CLIENT I.D.	: 1-2-25	DATE ANALYZED	: 02/19/90
SAMPLE MATRIX	: SOIL	UNITS	: MG/KG
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROMETHANE	<0.50
BROMOMETHANE	<0.50
VINYL CHLORIDE	<0.05
CHLOROETHANE	<0.05
METHYLENE CHLORIDE	<0.3
ACETONE	<1.0
CARBON DISULFIDE	<0.05
1,1-DICHLOROETHENE	<0.05
1,1-DICHLOROETHANE	<0.05
1,2-DICHLOROETHENE (TOTAL)	<0.05
CHLOROFORM	<0.05
1,2-DICHLOROETHANE	<0.05
2-BUTANONE (MEK)	<1.0
1,1,1-TRICHLOROETHANE	<0.05
CARBON TETRACHLORIDE	<0.05
VINYL ACETATE	<0.50
BROMODICHLOROMETHANE	<0.05
1,1,2,2-TETRACHLOROETHANE	<0.05
1,2-DICHLOROPROPANE	<0.05
TRANS-1,3-DICHLOROPROPENE	<0.05
TRICHLOROETHENE	<0.05
DIBROMOCHLOROMETHANE	<0.05
1,1,2 TRICHLOROETHANE	<0.05
BENZENE	<0.05
CIS-1,3-DICHLOROPROPENE	<0.05
BROMOFORM	<0.3
2-HEXANONE (MBK)	<0.50
4-METHYL-2-PENTANONE (MIBK)	<0.50
TETRACHLOROETHENE	<0.05
TOLUENE	<0.10
CHLOROBENZENE	<0.05
ETHYL BENZENE	<0.05
STYRENE	<0.05
TOTAL XYLENES	<0.05

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	86
BFB (%)	85
TOLUENE-D8 (%)	85

Analytical Technologies, Inc. ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

ATI I.D. : 00222002

MATRIX : SOIL

UNITS : MG/KG

COMPOUNDS	RESULTS
NONE DETECTED	N/A

Analytical**Technologies**,Inc.

GCMS - RESULTS

ATI I.D. : 00222003

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

CLIENT	: ENGINEERING ENTERPRISES-LONG BEACH	DATE SAMPLED	: 02/15/90
PROJECT #	: 512-345	DATE RECEIVED	: 02/16/90
PROJECT NAME	: (NONE)	DATE EXTRACTED	: 02/19/90
CLIENT I.D.	: 1-3-30	DATE ANALYZED	: 02/19/90
SAMPLE MATRIX	: SOIL	UNITS	: MG/KG
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROMETHANE	<0.50
BROMOMETHANE	<0.50
VINYL CHLORIDE	<0.05
CHLOROETHANE	<0.05
METHYLENE CHLORIDE	<0.3
ACETONE	<1.0
CARBON DISULFIDE	<0.05
1,1-DICHLOROETHENE	<0.05
1,1-DICHLOROETHANE	<0.05
1,2-DICHLOROETHENE (TOTAL)	<0.05
CHLOROFORM	<0.05
1,2-DICHLOROETHANE	<0.05
2-BUTANONE (MEK)	<1.0
1,1,1-TRICHLOROETHANE	<0.05
CARBON TETRACHLORIDE	<0.05
VINYL ACETATE	<0.50
BROMODICHLOROMETHANE	<0.05
1,1,2,2-TETRACHLOROETHANE	<0.05
1,2-DICHLOROPROPANE	<0.05
TRANS-1,3-DICHLOROPROPENE	<0.05
TRICHLOROETHENE	<0.05
DIBROMOCHLOROMETHANE	<0.05
1,1,2 TRICHLOROETHANE	<0.05
BENZENE	<0.05
CIS-1,3-DICHLOROPROPENE	<0.05
BROMOFORM	<0.3
2-HEXANONE (MBK)	<0.50
4-METHYL-2-PENTANONE (MIBK)	<0.50
TETRACHLOROETHENE	<0.05
TOLUENE	<0.10
CHLOROBENZENE	<0.05
ETHYL BENZENE	<0.05
STYRENE	<0.05
TOTAL XYLENES	<0.05

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	99
BFB (%)	95
TOLUENE-D8 (%)	98

Analytical**Technologies**, Inc. ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

ATI I.D. : 00222003

MATRIX : SOIL

UNITS : MG/KG

COMPOUNDS	RESULTS
NONE DETECTED	N/A

AnalyticalTechnologies,Inc.

GCMS - RESULTS

ATI I.D. : 00222004

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

CLIENT	: ENGINEERING ENTERPRISES-LONG BEACH	DATE SAMPLED	: 02/15/90
PROJECT #	: 512-345	DATE RECEIVED	: 02/16/90
PROJECT NAME	: (NONE)	DATE EXTRACTED	: 02/19/90
CLIENT I.D.	: 1-4-35	DATE ANALYZED	: 02/20/90
SAMPLE MATRIX	: SOIL	UNITS	: MG/KG
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROMETHANE	<0.50
BROMOMETHANE	<0.50
VINYL CHLORIDE	<0.05
CHLOROETHANE	<0.05
METHYLENE CHLORIDE	<0.3
ACETONE	<1.0
CARBON DISULFIDE	<0.05
1,1-DICHLOROETHENE	<0.05
1,1-DICHLOROETHANE	<0.05
1,2-DICHLOROETHENE (TOTAL)	<0.05
CHLOROFORM	<0.05
1,2-DICHLOROETHANE	<0.05
2-BUTANONE (MEK)	<1.0
1,1,1-TRICHLOROETHANE	<0.05
CARBON TETRACHLORIDE	<0.05
VINYL ACETATE	<0.50
BROMODICHLOROMETHANE	<0.05
1,1,2,2-TETRACHLOROETHANE	<0.05
1,2-DICHLOROPROPANE	<0.05
TRANS-1,3-DICHLOROPROPENE	<0.05
TRICHLOROETHENE	<0.05
DIBROMOCHLOROMETHANE	<0.05
1,1,2 TRICHLOROETHANE	<0.05
BENZENE	<0.05
CIS-1,3-DICHLOROPROPENE	<0.05
BROMOFORM	<0.3
2-HEXANONE (MBK)	<0.50
4-METHYL-2-PENTANONE (MIBK)	<0.50
TETRACHLOROETHENE	<0.05
TOLUENE	<0.10
CHLOROBENZENE	<0.05
ETHYL BENZENE	<0.05
STYRENE	<0.05
TOTAL XYLENES	<0.05

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	84
BFB (%)	86
TOLUENE-D8 (%)	88

Analytical**Technologies,**Inc. ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

ATI I.D. : 00222004

MATRIX : SOIL

UNITS : MG/KG

COMPOUNDS	RESULTS
NONE DETECTED	N/A

Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 00222005

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

CLIENT	: ENGINEERING ENTERPRISES-LONG BEACH	DATE SAMPLED	: 02/15/90
PROJECT #	: 512-345	DATE RECEIVED	: 02/16/90
PROJECT NAME	: (NONE)	DATE EXTRACTED	: 02/19/90
CLIENT I.D.	: 1-5-40	DATE ANALYZED	: 02/20/90
SAMPLE MATRIX	: SOIL	UNITS	: MG/KG
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROMETHANE	<0.50
BROMOMETHANE	<0.50
VINYL CHLORIDE	<0.05
CHLOROETHANE	<0.05
METHYLENE CHLORIDE	<0.3
ACETONE	<1.0
CARBON DISULFIDE	<0.05
1,1-DICHLOROETHENE	<0.05
1,1-DICHLOROETHANE	<0.05
1,2-DICHLOROETHENE (TOTAL)	<0.05
CHLOROFORM	<0.05
1,2-DICHLOROETHANE	<0.05
2-BUTANONE (MEK)	<1.0
1,1,1-TRICHLOROETHANE	<0.05
CARBON TETRACHLORIDE	<0.05
VINYL ACETATE	<0.50
BROMODICHLOROMETHANE	<0.05
1,1,2,2-TETRACHLOROETHANE	<0.05
1,2-DICHLOROPROPANE	<0.05
TRANS-1,3-DICHLOROPROPENE	<0.05
TRICHLOROETHENE	<0.05
DIBROMOCHLOROMETHANE	<0.05
1,1,2 TRICHLOROETHANE	<0.05
BENZENE	<0.05
CIS-1,3-DICHLOROPROPENE	<0.05
BROMOFORM	<0.3
2-HEXANONE (MBK)	<0.50
4-METHYL-2-PENTANONE (MIBK)	<0.50
TETRACHLOROETHENE	<0.05
TOLUENE	<0.10
CHLOROBENZENE	<0.05
ETHYL BENZENE	<0.05
STYRENE	<0.05
TOTAL XYLENES	<0.05

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	88
BFB (%)	95
TOLUENE-D8 (%)	93

Analytical**Technologies,**Inc. ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

ATI I.D. : 00222005

MATRIX : SOIL

UNITS : MG/KG

COMPOUNDS	RESULTS
NONE DETECTED	N/A

AnalyticalTechnologies,Inc.

GCMS - RESULTS

ATI I.D. : 00222006

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

CLIENT	: ENGINEERING ENTERPRISES-LONG BEACH	DATE SAMPLED	: 02/15/90
PROJECT #	: 512-345	DATE RECEIVED	: 02/16/90
PROJECT NAME	: (NONE)	DATE EXTRACTED	: 02/19/90
CLIENT I.D.	: 2-1-20	DATE ANALYZED	: 02/20/90
SAMPLE MATRIX	: SOIL	UNITS	: MG/KG
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROMETHANE	<0.50
BROMOMETHANE	<0.50
VINYL CHLORIDE	<0.05
CHLOROETHANE	<0.05
METHYLENE CHLORIDE	<0.3
ACETONE	<1.0
CARBON DISULFIDE	<0.05
1,1-DICHLOROETHENE	<0.05
1,1-DICHLOROETHANE	<0.05
1,2-DICHLOROETHENE (TOTAL)	<0.05
CHLOROFORM	<0.05
1,2-DICHLOROETHANE	<0.05
2-BUTANONE (MEK)	<1.0
1,1,1-TRICHLOROETHANE	<0.05
CARBON TETRACHLORIDE	<0.05
VINYL ACETATE	<0.50
BROMODICHLOROMETHANE	<0.05
1,1,2,2-TETRACHLOROETHANE	<0.05
1,2-DICHLOROPROPANE	<0.05
TRANS-1,3-DICHLOROPROPENE	<0.05
TRICHLOROETHENE	<0.05
DIBROMOCHLOROMETHANE	<0.05
1,1,2 TRICHLOROETHANE	<0.05
BENZENE	<0.05
CIS-1,3-DICHLOROPROPENE	<0.05
BROMOFORM	<0.3
2-HEXANONE (MBK)	<0.50
4-METHYL-2-PENTANONE (MIBK)	<0.50
TETRACHLOROETHENE	<0.05
TOLUENE	<0.10
CHLOROBENZENE	<0.05
ETHYL BENZENE	<0.05
STYRENE	<0.05
TOTAL XYLENES	<0.05

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	95
BFB (%)	92
TOLUENE-D8 (%)	93

Analytical**Technologies,**Inc. ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

ATI I.D. : 00222006

MATRIX : SOIL

UNITS : MG/KG

COMPOUNDS	RESULTS
NONE DETECTED	N/A

AnalyticalTechnologies,Inc.

GCMS - RESULTS

ATI I.D. : 00222007

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

CLIENT	: ENGINEERING ENTERPRISES-LONG BEACH	DATE SAMPLED	: 02/15/90
PROJECT #	: 512-345	DATE RECEIVED	: 02/16/90
PROJECT NAME	: (NONE)	DATE EXTRACTED	: 02/19/90
CLIENT I.D.	: 2-2-25	DATE ANALYZED	: 02/20/90
SAMPLE MATRIX	: SOIL	UNITS	: MG/KG
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROMETHANE	<0.50
BROMOMETHANE	<0.50
VINYL CHLORIDE	<0.05
CHLOROETHANE	<0.05
METHYLENE CHLORIDE	<0.3
ACETONE	<1.0
CARBON DISULFIDE	<0.05
1,1-DICHLOROETHENE	<0.05
1,1-DICHLOROETHANE	<0.05
1,2-DICHLOROETHENE (TOTAL)	<0.05
CHLOROFORM	<0.05
1,2-DICHLOROETHANE	<0.05
2-BUTANONE (MEK)	<1.0
1,1,1-TRICHLOROETHANE	<0.05
CARBON TETRACHLORIDE	<0.05
VINYL ACETATE	<0.50
BROMODICHLOROMETHANE	<0.05
1,1,2,2-TETRACHLOROETHANE	<0.05
1,2-DICHLOROPROPANE	<0.05
TRANS-1,3-DICHLOROPROPENE	<0.05
TRICHLOROETHENE	<0.05
DIBROMOCHLOROMETHANE	<0.05
1,1,2 TRICHLOROETHANE	<0.05
BENZENE	<0.05
CIS-1,3-DICHLOROPROPENE	<0.05
BROMOFORM	<0.3
2-HEXANONE (MBK)	<0.50
4-METHYL-2-PENTANONE (MIBK)	<0.50
TETRACHLOROETHENE	<0.05
TOLUENE	<0.10
CHLOROBENZENE	<0.05
ETHYL BENZENE	<0.05
STYRENE	<0.05
TOTAL XYLENES	<0.05

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	86
BFB (%)	87
TOLUENE-D8 (%)	92

Analytical**Technologies,** Inc. ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

ATI I.D. : 00222007

MATRIX : SOIL

UNITS : MG/KG

COMPOUNDS	RESULTS
NONE DETECTED	N/A

AnalyticalTechnologies,Inc.

GCMS - RESULTS

ATI I.D. : 00222008

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

CLIENT	: ENGINEERING ENTERPRISES-LONG BEACH	DATE SAMPLED	: 02/15/90
PROJECT #	: 512-345	DATE RECEIVED	: 02/16/90
PROJECT NAME	: (NONE)	DATE EXTRACTED	: 02/19/90
CLIENT I.D.	: 2-3-30	DATE ANALYZED	: 02/20/90
SAMPLE MATRIX	: SOIL	UNITS	: MG/KG
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROMETHANE	<0.50
BROMOMETHANE	<0.50
VINYL CHLORIDE	<0.05
CHLOROETHANE	<0.05
METHYLENE CHLORIDE	<0.3
ACETONE	<1.0
CARBON DISULFIDE	0.14
1,1-DICHLOROETHENE	<0.05
1,1-DICHLOROETHANE	<0.05
1,2-DICHLOROETHENE (TOTAL)	<0.05
CHLOROFORM	<0.05
1,2-DICHLOROETHANE	<0.05
2-BUTANONE (MEK)	<1.0
1,1,1-TRICHLOROETHANE	<0.05
CARBON TETRACHLORIDE	<0.05
VINYL ACETATE	<0.50
BROMODICHLOROMETHANE	<0.05
1,1,2,2-TETRACHLOROETHANE	<0.05
1,2-DICHLOROPROPANE	<0.05
TRANS-1,3-DICHLOROPROPENE	<0.05
TRICHLOROETHENE	0.11
DIBROMOCHLOROMETHANE	<0.05
1,1,2 TRICHLOROETHANE	<0.05
BENZENE	<0.05
CIS-1,3-DICHLOROPROPENE	<0.05
BROMOFORM	<0.3
2-HEXANONE (MBK)	<0.50
4-METHYL-2-PENTANONE (MIBK)	<0.50
TETRACHLOROETHENE	<0.05
TOLUENE	<0.10
CHLOROBENZENE	<0.05
ETHYL BENZENE	<0.05
STYRENE	<0.05
TOTAL XYLENES	<0.05

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	96
BFB (%)	95
TOLUENE-D8 (%)	94

Analytical**Technologies,**Inc. ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

ATI I.D. : 00222008

MATRIX : SOIL

UNITS : MG/KG

COMPOUNDS	RESULTS
NONE DETECTED	N/A

AnalyticalTechnologies,Inc.

GCMS - RESULTS

ATI I.D. : 00222009

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

CLIENT	: ENGINEERING ENTERPRISES-LONG BEACH	DATE SAMPLED	: 02/15/90
PROJECT #	: 512-345	DATE RECEIVED	: 02/16/90
PROJECT NAME	: (NONE)	DATE EXTRACTED	: 02/19/90
CLIENT I.D.	: 2-4-35	DATE ANALYZED	: 02/20/90
SAMPLE MATRIX	: SOIL	UNITS	: MG/KG
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROMETHANE	<0.50
BROMOMETHANE	<0.50
VINYL CHLORIDE	<0.05
CHLOROETHANE	<0.05
METHYLENE CHLORIDE	<0.3
ACETONE	<1.0
CARBON DISULFIDE	0.06
1,1-DICHLOROETHENE	<0.05
1,1-DICHLOROETHANE	<0.05
1,2-DICHLOROETHENE (TOTAL)	<0.05
CHLOROFORM	<0.05
1,2-DICHLOROETHANE	<0.05
2-BUTANONE (MEK)	<1.0
1,1,1-TRICHLOROETHANE	<0.05
CARBON TETRACHLORIDE	<0.05
VINYL ACETATE	<0.50
BROMODICHLOROMETHANE	<0.05
1,1,2,2-TETRACHLOROETHANE	<0.05
1,2-DICHLOROPROPANE	<0.05
TRANS-1,3-DICHLOROPROPENE	<0.05
TRICHLOROETHENE	0.86
DIBROMOCHLOROMETHANE	<0.05
1,1,2 TRICHLOROETHANE	<0.05
BENZENE	0.05
CIS-1,3-DICHLOROPROPENE	<0.05
BROMOFORM	<0.3
2-HEXANONE (MBK)	<0.50
4-METHYL-2-PENTANONE (MIBK)	<0.50
TETRACHLOROETHENE	<0.05
TOLUENE	<0.10
CHLOROBENZENE	<0.05
ETHYL BENZENE	<0.05
STYRENE	<0.05
TOTAL XYLENES	<0.05

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	87
BFB (%)	84
TOLUENE-D8 (%)	87

Analytical Technologies, Inc. ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

ATI I.D. : 00222009

MATRIX : SOIL

UNITS : MG/KG

COMPOUNDS	RESULTS
NONE DETECTED	N/A

AnalyticalTechnologies,Inc.

GCMS - RESULTS

ATI I.D. : 00222010

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

CLIENT	: ENGINEERING ENTERPRISES-LONG BEACH	DATE SAMPLED	: 02/15/90
PROJECT #	: 512-345	DATE RECEIVED	: 02/16/90
PROJECT NAME	: (NONE)	DATE EXTRACTED	: 02/19/90
CLIENT I.D.	: 2-5-40	DATE ANALYZED	: 02/20/90
SAMPLE MATRIX	: SOIL	UNITS	: MG/KG
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROMETHANE	<0.50
BROMOMETHANE	<0.50
VINYL CHLORIDE	<0.05
CHLOROETHANE	<0.05
METHYLENE CHLORIDE	<0.3
ACETONE	<1.0
CARBON DISULFIDE	<0.05
1,1-DICHLOROETHENE	<0.05
1,1-DICHLOROETHANE	<0.05
1,2-DICHLOROETHENE (TOTAL)	<0.05
CHLOROFORM	<0.05
1,2-DICHLOROETHANE	<0.05
2-BUTANONE (MEK)	<1.0
1,1,1-TRICHLOROETHANE	0.07
CARBON TETRACHLORIDE	<0.05
VINYL ACETATE	<0.50
BROMODICHLOROMETHANE	<0.05
1,1,2,2-TETRACHLOROETHANE	<0.05
1,2-DICHLOROPROPANE	<0.05
TRANS-1,3-DICHLOROPROPENE	<0.05
TRICHLOROETHENE	0.15
DIBROMOCHLOROMETHANE	<0.05
1,1,2 TRICHLOROETHANE	<0.05
BENZENE	<0.05
CIS-1,3-DICHLOROPROPENE	<0.05
BROMOFORM	<0.3
2-HEXANONE (MBK)	<0.50
4-METHYL-2-PENTANONE (MIBK)	<0.50
TETRACHLOROETHENE	0.20
TOLUENE	<0.10
CHLOROBENZENE	<0.05
ETHYL BENZENE	<0.05
STYRENE	<0.05
TOTAL XYLENES	<0.05

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	87
BFB (%)	85
TOLUENE-D8 (%)	83

Analytical**Technologies**, Inc. ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

ATI I.D. : 00222010

MATRIX : SOIL

UNITS : MG/KG

COMPOUNDS	RESULTS
NONE DETECTED	N/A

Analytical**Technologies**,Inc. GCMS - RESULTS

REAGENT BLANK

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

CLIENT	: ENGINEERING ENTERPRISES-LONG BEACH	ATI I.D.	: 002220
PROJECT #	: 512-345	DATE EXTRACTED	: 02/19/90
PROJECT NAME	: (NONE)	DATE ANALYZED	: 02/19/90
CLIENT I.D.	: REAGENT BLANK	UNITS	: MG/KG
		DILUTION FACTOR	: N/A

COMPOUNDS	RESULTS
CHLOROMETHANE	<0.50
BROMOMETHANE	<0.50
VINYL CHLORIDE	<0.05
CHLOROETHANE	<0.05
METHYLENE CHLORIDE	<0.3
ACETONE	<1.0
CARBON DISULFIDE	<0.05
1,1-DICHLOROETHENE	<0.05
1,1-DICHLOROETHANE	<0.05
1,2-DICHLOROETHENE (TOTAL)	<0.05
CHLOROFORM	<0.05
1,2-DICHLOROETHANE	<0.05
2-BUTANONE (MEK)	<1.0
1,1,1-TRICHLOROETHANE	<0.05
CARBON TETRACHLORIDE	<0.05
VINYL ACETATE	<0.50
BROMODICHLOROMETHANE	<0.05
1,1,2,2-TETRACHLOROETHANE	<0.05
1,2-DICHLOROPROPANE	<0.05
TRANS-1,3-DICHLOROPROPENE	<0.05
TRICHLOROETHENE	<0.05
DIBROMOCHLOROMETHANE	<0.05
1,1,2 TRICHLOROETHANE	<0.05
BENZENE	<0.05
CIS-1,3-DICHLOROPROPENE	<0.05
BROMOFORM	<0.3
2-HEXANONE (MBK)	<0.50
4-METHYL-2-PENTANONE (MIBK)	<0.50
TETRACHLOROETHENE	<0.05
TOLUENE	<0.10
CHLOROBENZENE	<0.05
ETHYL BENZENE	<0.05
STYRENE	<0.05
TOTAL XYLENES	<0.05

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	96
BFB (%)	96
TOLUENE-D8 (%)	98

Analytical**Technologies**,Inc. GCMS - RESULTS

REAGENT BLANK

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

CLIENT : ENGINEERING ENTERPRISES-LONG BEACH   ATI I.D. : 002220

UNITS : MG/KG

COMPOUNDS	RESULTS
119 ALIPHATIC HYDROCARBON (C3)	0.9

AnalyticalTechnologies,Inc.

QUALITY CONTROL DATA

ATI I.D. : 002220

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

CLIENT : ENGINEERING ENTERPRISES-LONG BEACH
PROJECT # : 512-345
PROJECT NAME : (NONE)
REF I.D. : 00222002

DATE EXTRACTED : 02/19/90
DATE ANALYZED : 02/19/90
SAMPLE MATRIX : SOIL
UNITS : MG/KG

COMPOUNDS	SAMPLE RESULT	CONC. SPIKED	SPIKED SAMPLE	% REC.	DUP. SPIKED SAMPLE	DUP. % REC.	RPD
1,1-DICHLOROETHENE	<0.05	2.5	2.6	104	2.1	84	21
TRICHLOROETHENE	<0.05	3.0	3.1	103	2.8	93	10
CHLOROBENZENE	<0.05	3.0	3.1	103	2.9	97	6
TOLUENE	<0.05	3.0	2.9	97	2.8	93	4
BENZENE	<0.05	3.0	2.9	97	2.5	83	16

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Spiked Sample Result} - \text{Duplicate Spike Sample Result})}{\text{Average of Spiked Sample}} \times 100$$

AnalyticalTechnologies,Inc.

QUALITY CONTROL DATA

ATI I.D. : 002220

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

CLIENT : ENGINEERING ENTERPRISES-LONG BEACH
PROJECT # : 512-345
PROJECT NAME : (NONE)
REF I.D. : 00222006

DATE EXTRACTED : 02/19/90
DATE ANALYZED : 02/20/90
SAMPLE MATRIX : SOIL
UNITS : MG/KG

COMPOUNDS	SAMPLE RESULT	CONC. SPIKED	SPIKED SAMPLE	% REC.	DUP. SPIKED SAMPLE	DUP. % REC.	RPD
1,1-DICHLOROETHENE	<0.05	2.5	2.3	92	2.1	84	9
TRICHLOROETHENE	<0.05	3.0	3.0	100	2.8	93	7
CHLOROBENZENE	<0.05	3.0	3.0	100	3.0	100	0
TOLUENE	<0.05	3.0	2.8	93	2.8	93	0
BENZENE	<0.05	3.0	2.7	90	2.5	83	8

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Spiked Sample Result} - \text{Duplicate Spike Sample Result})}{\text{Average of Spiked Sample}} \times 100$$

002220

EEI ENGINEERING ENTERPRISES, INC.
21818 WILMINGTON AVE., SUITE 405
LONG BEACH, CA 90810 (213)518-4597

CHAIN OF CUSTODY RECORD

LABORATORY: Analytical Technologies Inc.
5550 Morehouse Dr.
San Diego, Ca.

PROJECT NO. 512-345

PURCHASE ORDER NO.

SAMPLERS:(signature) Bruce Charest, Tom Danaher

Phone No. 213-430-6500

Phone No: 619-458-9141

Remarks:

ANALYSES REQUESTED

	SAMPLE NO.	DATE	TIME	8240	Number of Containers	REMARKS
01	1-1-20	2-15	AM		1	RTC - per Tom
02	1-2-25					2-21-90
03	1-3-30					
04	1-4-35					
05	1-5-40					
	2-1-20		PM			
	2-2-25					
	2-3-30					
	2-4-35					
10	2-5-40					

PINK COPY: SAMPLER RETAINS YELLOW COPY: LABORATORY COPY

WHITE COPY: LABORATORY SIGNS AND RETURNS WITH ANALYTICAL RESULTS

TOTAL NUMBER OF CONTAINERS 10

Relinquished by:(signature)	Received by:(signature)	Date/Time
B. Charest	[signature]	2-16-90 3:12pm
[signature]		2-16-90
	Marian Van Eckhoff	2-16-90

APPENDIX C

PART II

LABORATORY REPORTS - GROUNDWATER FEBRUARY 1, 1990

AnalyticalTechnologies,Inc. Corporate Offices: 5550 Morenouse Drive San Diego, CA 92121 (619) 458-9141

ATI I.D. 002037

February 12, 1990

Engineering Enterprises, Inc.
6695 E. Pacific Coast Highway
Long Beach, California 90803

Project No.: 512-345

Attention: Bill Halbert

On February 2, 1990, Analytical Technologies, Inc. received seven water samples for analysis. The samples were analyzed with EPA methodology or equivalent methods as specified in the attached analytical schedule. The symbol for "less than" indicates a value below the reportable detection limit. Please see the attached sheet for the sample cross reference.

The results of this analysis and the quality control data are enclosed.

Carolyn A. Sites
Carolyn A. Sites
GC/MS Supervisor

CAS:nm

Richard M. Amano
for Laboratory Manager

AnalyticalTechnologies,Inc. ATI I.D. 002037

ANALYTICAL SCHEDULE

CLIENT: ENGINEERING ENTERPRISES, INC. PROJECT NO.: 512-345
PROJECT NAME: (NONE)

ANALYSIS	TECHNIQUE	REFERENCE/METHOD
VOLATILE ORGANICS	GC/MS	EPA 8240

AnalyticalTechnologies,Inc.

CLIENT : ENGINEERING ENTERPRISES-LONG BEACH DATE RECEIVED : 02/02/90
PROJECT # : 512-345
PROJECT NAME : (NONE) REPORT DATE : 02/12/90

ATI I.D. : 002037

ATI #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	W-05-01	WATER	02/01/90
02	W-04-02	WATER	02/01/90
03	W-06-03	WATER	02/01/90
04	W-03-04	WATER	02/01/90
05	W-02-05	WATER	02/01/90
06	W-22-06	WATER	02/01/90
07	W-01-07	WATER	02/01/90

----- TOTALS -----

MATRIX	# SAMPLES
WATER	7

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.

AnalyticalTechnologies,Inc.

GCMS - RESULTS

ATI I.D. : 00203701

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

CLIENT	: ENGINEERING ENTERPRISES-LONG BEACH	DATE SAMPLED	: 02/01/90
PROJECT #	: 512-345	DATE RECEIVED	: 02/02/90
PROJECT NAME	: (NONE)	DATE EXTRACTED	: N/A
CLIENT I.D.	: W-05-01	DATE ANALYZED	: 02/07/90
SAMPLE MATRIX	: WATER	UNITS	: UG/L
		DILUTION FACTOR	: 40

COMPOUNDS	RESULTS
CHLOROMETHANE	<400
BROMOMETHANE	<400
VINYL CHLORIDE	<40
CHLOROETHANE	<40
METHYLENE CHLORIDE	<200
ACETONE	<800
CARBON DISULFIDE	<40
1,1-DICHLOROETHENE	63
1,1-DICHLOROETHANE	<40
1,2-DICHLOROETHENE (TOTAL)	200
CHLOROFORM	<40
1,2-DICHLOROETHANE	<40
2-BUTANONE (MEK)	<800
1,1,1-TRICHLOROETHANE	<40
CARBON TETRACHLORIDE	<40
VINYL ACETATE	<400
BROMODICHLOROMETHANE	<40
1,1,2,2-TETRACHLOROETHANE	<40
1,2-DICHLOROPROPANE	<40
CIS-1,3-DICHLOROPROPENE	<40
TRICHLOROETHENE	5800
DIBROMOCHLOROMETHANE	<40
1,1,2 TRICHLOROETHANE	<40
BENZENE	<40
TRANS-1,3-DICHLOROPROPENE	<40
BROMOFORM	<200
2-HEXANONE (MBK)	<400
4-METHYL-2-PENTANONE (MIBK)	<400
TETRACHLOROETHENE	1600
TOLUENE	<80
CHLOROBENZENE	<40
ETHYL BENZENE	<40
STYRENE	<40
TOTAL XYLENES	<40

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	93
BFB (%)	100
TOLUENE-D8 (%)	101

Analytical Technologies, Inc.

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

ATI I.D. : 00203701

MATRIX : WATER

UNITS : UG/L

COMPOUNDS	RESULTS
NONE DETECTED	N/A

Analytical Technologies, Inc.

GCMS - RESULTS

ATI I.D. : 00203702

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

CLIENT	: ENGINEERING ENTERPRISES-LONG BEACH	DATE SAMPLED	: 02/01/90
PROJECT #	: 512-345	DATE RECEIVED	: 02/02/90
PROJECT NAME	: (NONE)	DATE EXTRACTED	: N/A
CLIENT I.D.	: W-04-02	DATE ANALYZED	: 02/07/90
SAMPLE MATRIX	: WATER	UNITS	: UG/L
		DILUTION FACTOR	: 10

COMPOUNDS	RESULTS
CHLOROMETHANE	<100
BROMOMETHANE	<100
VINYL CHLORIDE	<10
CHLOROETHANE	<10
METHYLENE CHLORIDE	<50
ACETONE	<200
CARBON DISULFIDE	<10
1,1-DICHLOROETHENE	17
1,1-DICHLOROETHANE	<10
1,2-DICHLOROETHENE (TOTAL)	64
CHLOROFORM	<10
1,2-DICHLOROETHANE	<10
2-BUTANONE (MEK)	<200
1,1,1-TRICHLOROETHANE	<10
CARBON TETRACHLORIDE	<10
VINYL ACETATE	<100
BROMODICHLOROMETHANE	<10
1,1,2,2-TETRACHLOROETHANE	<10
1,2-DICHLOROPROPANE	<10
CIS-1,3-DICHLOROPROPENE	<10
TRICHLOROETHENE	1400
DIBROMOCHLOROMETHANE	<10
1,1,2 TRICHLOROETHANE	<10
BENZENE	<10
TRANS-1,3-DICHLOROPROPENE	<10
BROMOFORM	<50
2-HEXANONE (MBK)	<100
4-METHYL-2-PENTANONE (MIBK)	<100
TETRACHLOROETHENE	310
TOLUENE	<20
CHLOROBENZENE	<10
ETHYL BENZENE	<10
STYRENE	<10
TOTAL XYLENES	<10

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	92
BFB (%)	101
TOLUENE-D8 (%)	101

Analytical Technologies, Inc.

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

ATI I.D. : 00203702

MATRIX : WATER

UNITS : UG/L

COMPOUNDS	RESULTS
NONE DETECTED	N/A

Analytical**Technologies**,Inc.

GCMS - RESULTS

ATI I.D. : 00203703

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

CLIENT	: ENGINEERING ENTERPRISES-LONG BEACH	DATE SAMPLED	: 02/01/90
PROJECT #	: 512-345	DATE RECEIVED	: 02/02/90
PROJECT NAME	: (NONE)	DATE EXTRACTED	: N/A
CLIENT I.D.	: W-06-03	DATE ANALYZED	: 02/07/90
SAMPLE MATRIX	: WATER	UNITS	: UG/L
		DILUTION FACTOR	: 15

COMPOUNDS	RESULTS
CHLOROMETHANE	<150
BROMOMETHANE	<150
VINYL CHLORIDE	<15
CHLOROETHANE	<15
METHYLENE CHLORIDE	<75
ACETONE	<300
CARBON DISULFIDE	<15
1,1-DICHLOROETHENE	21
1,1-DICHLOROETHANE	<15
1,2-DICHLOROETHENE (TOTAL)	21
CHLOROFORM	<15
1,2-DICHLOROETHANE	<15
2-BUTANONE (MEK)	<300
1,1,1-TRICHLOROETHANE	<15
CARBON TETRACHLORIDE	<15
VINYL ACETATE	<150
BROMODICHLOROMETHANE	<15
1,1,2,2-TETRACHLOROETHANE	<15
1,2-DICHLOROPROPANE	<15
CIS-1,3-DICHLOROPROPENE	<15
TRICHLOROETHENE	1900
DIBROMOCHLOROMETHANE	<15
1,1,2 TRICHLOROETHANE	<15
BENZENE	<15
TRANS-1,3-DICHLOROPROPENE	<15
BROMOFORM	<75
2-HEXANONE (MBK)	<150
4-METHYL-2-PENTANONE (MIBK)	<150
TETRACHLOROETHENE	780
TOLUENE	<30
CHLOROBENZENE	<15
ETHYL BENZENE	<15
STYRENE	<15
TOTAL XYLENES	<15

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	92
BFB (%)	99
TOLUENE-D8 (%)	99

Analytical Technologies, Inc. ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

ATI I.D. : 00203703

MATRIX : WATER

UNITS : UG/L

COMPOUNDS	RESULTS
NONE DETECTED	N/A

AnalyticalTechnologies,Inc.

GCMS - RESULTS

ATI I.D. : 00203704

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

CLIENT	: ENGINEERING ENTERPRISES-LONG BEACH	DATE SAMPLED	: 02/01/90
PROJECT #	: 512-345	DATE RECEIVED	: 02/02/90
PROJECT NAME	: (NONE)	DATE EXTRACTED	: N/A
CLIENT I.D.	: W-03-04	DATE ANALYZED	: 02/07/90
SAMPLE MATRIX	: WATER	UNITS	: UG/L
		DILUTION FACTOR	: 15

COMPOUNDS	RESULTS
CHLOROMETHANE	<150
BROMOMETHANE	<150
VINYL CHLORIDE	<15
CHLOROETHANE	<15
METHYLENE CHLORIDE	<75
ACETONE	<300
CARBON DISULFIDE	<15
1,1-DICHLOROETHENE	<15
1,1-DICHLOROETHANE	<15
1,2-DICHLOROETHENE (TOTAL)	54
CHLOROFORM	<15
1,2-DICHLOROETHANE	<15
2-BUTANONE (MEK)	<300
1,1,1-TRICHLOROETHANE	<15
CARBON TETRACHLORIDE	<15
VINYL ACETATE	<150
BROMODICHLOROMETHANE	<15
1,1,2,2-TETRACHLOROETHANE	<15
1,2-DICHLOROPROPANE	<15
CIS-1,3-DICHLOROPROPENE	<15
TRICHLOROETHENE	1700
DIBROMOCHLOROMETHANE	<15
1,1,2 TRICHLOROETHANE	<15
BENZENE	<15
TRANS-1,3-DICHLOROPROPENE	<15
BROMOFORM	<75
2-HEXANONE (MBK)	<150
4-METHYL-2-PENTANONE (MIBK)	<150
TETRACHLOROETHENE	240
TOLUENE	<30
CHLOROBENZENE	<15
ETHYL BENZENE	<15
STYRENE	<15
TOTAL XYLENES	<15

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	92
BFB (%)	101
TOLUENE-D8 (%)	100

Analytical**Technologies**,Inc.

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

ATI I.D. : 00203704

MATRIX : WATER

UNITS : UG/L

COMPOUNDS	RESULTS
NONE DETECTED	N/A

AnalyticalTechnologies,Inc.

GCMS - RESULTS

ATI I.D. : 00203705

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

CLIENT	: ENGINEERING ENTERPRISES-LONG BEACH	DATE SAMPLED	: 02/01/90
PROJECT #	: 512-345	DATE RECEIVED	: 02/02/90
PROJECT NAME	: (NONE)	DATE EXTRACTED	: N/A
CLIENT I.D.	: W-02-05	DATE ANALYZED	: 02/07/90
SAMPLE MATRIX	: WATER	UNITS	: UG/L
		DILUTION FACTOR	: 4

COMPOUNDS	RESULTS
CHLOROMETHANE	<40
BROMOMETHANE	<40
VINYL CHLORIDE	<4
CHLOROETHANE	<4
METHYLENE CHLORIDE	<20
ACETONE	<80
CARBON DISULFIDE	<4
1,1-DICHLOROETHENE	<4
1,1-DICHLOROETHANE	<4
1,2-DICHLOROETHENE (TOTAL)	<4
CHLOROFORM	<4
1,2-DICHLOROETHANE	<4
2-BUTANONE (MEK)	<80
1,1,1-TRICHLOROETHANE	<4
CARBON TETRACHLORIDE	<4
VINYL ACETATE	<40
BROMODICHLOROMETHANE	<4
1,1,2,2-TETRACHLOROETHANE	<4
1,2-DICHLOROPROPANE	<4
CIS-1,3-DICHLOROPROPENE	<4
TRICHLOROETHENE	500
DIBROMOCHLOROMETHANE	<4
1,1,2 TRICHLOROETHANE	<4
BENZENE	<4
TRANS-1,3-DICHLOROPROPENE	<4
BROMOFORM	<20
2-HEXANONE (MBK)	<40
4-METHYL-2-PENTANONE (MIBK)	<40
TETRACHLOROETHENE	50
TOLUENE	<8
CHLOROBENZENE	<4
ETHYL BENZENE	<4
STYRENE	<4
TOTAL XYLENES	<4

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	91
BFB (%)	100
TOLUENE-D8 (%)	99

AnalyticalTechnologies,Inc. ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

ATI I.D. : 00203705

MATRIX : WATER

UNITS : UG/L

COMPOUNDS	RESULTS
NONE DETECTED	N/A

Analytical**Technologies**,Inc.

GCMS - RESULTS

ATI I.D. : 00203706

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

CLIENT	: ENGINEERING ENTERPRISES-LONG BEACH	DATE SAMPLED	: 02/01/90
PROJECT #	: 512-345	DATE RECEIVED	: 02/02/90
PROJECT NAME	: (NONE)	DATE EXTRACTED	: N/A
CLIENT I.D.	: W-22-06	DATE ANALYZED	: 02/07/90
SAMPLE MATRIX	: WATER	UNITS	: UG/L
		DILUTION FACTOR	: 5

COMPOUNDS	RESULTS
CHLOROMETHANE	<50
BROMOMETHANE	<50
VINYL CHLORIDE	<5
CHLOROETHANE	<5
METHYLENE CHLORIDE	<25
ACETONE	<100
CARBON DISULFIDE	<5
1,1-DICHLOROETHENE	<5
1,1-DICHLOROETHANE	<5
1,2-DICHLOROETHENE (TOTAL)	<5
CHLOROFORM	<5
1,2-DICHLOROETHANE	<5
2-BUTANONE (MEK)	<100
1,1,1-TRICHLOROETHANE	<5
CARBON TETRACHLORIDE	<5
VINYL ACETATE	<50
BROMODICHLOROMETHANE	<5
1,1,2,2-TETRACHLOROETHANE	<5
1,2-DICHLOROPROPANE	<5
CIS-1,3-DICHLOROPROPENE	<5
TRICHLOROETHENE	625
DIBROMOCHLOROMETHANE	<5
1,1,2 TRICHLOROETHANE	<5
BENZENE	<5
TRANS-1,3-DICHLOROPROPENE	<5
BROMOFORM	<25
2-HEXANONE (MBK)	<50
4-METHYL-2-PENTANONE (MIBK)	<50
TETRACHLOROETHENE	68
TOLUENE	<10
CHLOROBENZENE	<5
ETHYL BENZENE	<5
STYRENE	<5
TOTAL XYLENES	<5

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	90
BFB (%)	101
TOLUENE-D8 (%)	98

Analytical Technologies, Inc. ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

ATI I.D. : 00203706

MATRIX : WATER

UNITS : UG/L

COMPOUNDS	RESULTS
NONE DETECTED	N/A

AnalyticalTechnologies,Inc.

GCMS - RESULTS

ATI I.D. : 00203707

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

CLIENT	: ENGINEERING ENTERPRISES-LONG BEACH	DATE SAMPLED	: 02/01/90
PROJECT #	: 512-345	DATE RECEIVED	: 02/02/90
PROJECT NAME	: (NONE)	DATE EXTRACTED	: N/A
CLIENT I.D.	: W-01-07	DATE ANALYZED	: 02/08/90
SAMPLE MATRIX	: WATER	UNITS	: UG/L
		DILUTION FACTOR	: 80

COMPOUNDS	RESULTS
CHLOROMETHANE	<800
BROMOMETHANE	<800
VINYL CHLORIDE	<80
CHLOROETHANE	<80
METHYLENE CHLORIDE	10000
ACETONE	<1600
CARBON DISULFIDE	<80
1,1-DICHLOROETHENE	<80
1,1-DICHLOROETHANE	<80
1,2-DICHLOROETHENE (TOTAL)	<80
CHLOROFORM	<80
1,2-DICHLOROETHANE	<80
2-BUTANONE (MEK)	<1600
1,1,1-TRICHLOROETHANE	<80
CARBON TETRACHLORIDE	<80
VINYL ACETATE	<800
BROMODICHLOROMETHANE	<80
1,1,2,2-TETRACHLOROETHANE	<80
1,2-DICHLOROPROPANE	<80
CIS-1,3-DICHLOROPROPENE	<80
TRICHLOROETHENE	1000
DIBROMOCHLOROMETHANE	<80
1,1,2 TRICHLOROETHANE	<80
BENZENE	<80
TRANS-1,3-DICHLOROPROPENE	<80
BROMOFORM	<400
2-HEXANONE (MBK)	<800
4-METHYL-2-PENTANONE (MIBK)	<800
TETRACHLOROETHENE	<80
TOLUENE	<160
CHLOROBENZENE	<80
ETHYL BENZENE	<80
STYRENE	<80
TOTAL XYLENES	<80

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	84
BFB (%)	100
TOLUENE-D8 (%)	97

Analytical Technologies, Inc.

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

ATI I.D. : 00203707

MATRIX : WATER

UNITS : UG/L

COMPOUNDS	RESULTS
NONE DETECTED	N/A

AnalyticalTechnologies,Inc.

GCMS - RESULTS

REAGENT BLANK

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

CLIENT : ENGINEERING ENTERPRISES-LONG BEACH
PROJECT # : 512-345
PROJECT NAME : (NONE)
CLIENT I.D. : REAGENT BLANK

ATI I.D. : 002037
DATE EXTRACTED : N/A
DATE ANALYZED : 02/07/90
UNITS : UG/L
DILUTION FACTOR : N/A

COMPOUNDS	RESULTS
CHLOROMETHANE	<10
BROMOMETHANE	<10
VINYL CHLORIDE	<1
CHLOROETHANE	<1
METHYLENE CHLORIDE	<5
ACETONE	<20
CARBON DISULFIDE	<1
1,1-DICHLOROETHENE	<1
1,1-DICHLOROETHANE	<1
1,2-DICHLOROETHENE (TOTAL)	<1
CHLOROFORM	<1
1,2-DICHLOROETHANE	<1
2-BUTANONE (MEK)	<20
1,1,1-TRICHLOROETHANE	<1
CARBON TETRACHLORIDE	<1
VINYL ACETATE	<10
BROMODICHLOROMETHANE	<1
1,1,2,2-TETRACHLOROETHANE	<1
1,2-DICHLOROPROPANE	<1
CIS-1,3-DICHLOROPROPENE	<1
TRICHLOROETHENE	<1
DIBROMOCHLOROMETHANE	<1
1,1,2 TRICHLOROETHANE	<1
BENZENE	<1
TRANS-1,3-DICHLOROPROPENE	<1
BROMOFORM	<5
2-HEXANONE (MBK)	<10
4-METHYL-2-PENTANONE (MIBK)	<10
TETRACHLOROETHENE	<1
TOLUENE	<2
CHLOROBENZENE	<1
ETHYL BENZENE	<1
STYRENE	<1
TOTAL XYLENES	<1

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	95
BFB (%)	103
TOLUENE-D8 (%)	102

Analytical Technologies, Inc.

GCMS - RESULTS

REAGENT BLANK

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

CLIENT : ENGINEERING ENTERPRISES-LONG BEACH

ATI I.D. : 002037

UNITS : UG/L

COMPOUNDS	RESULTS
NONE DETECTED	N/A

AnalyticalTechnologies,Inc.

GCMS - RESULTS

REAGENT BLANK

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

CLIENT	: ENGINEERING ENTERPRISES-LONG BEACH	ATI I.D.	: 002037
PROJECT #	: 512-345	DATE EXTRACTED	: N/A
PROJECT NAME	: (NONE)	DATE ANALYZED	: 02/08/90
CLIENT I.D.	: REAGENT BLANK	UNITS	: UG/L
		DILUTION FACTOR	: N/A

COMPOUNDS	RESULTS
CHLOROMETHANE	<10
BROMOMETHANE	<10
VINYL CHLORIDE	<1
CHLOROETHANE	<1
METHYLENE CHLORIDE	<5
ACETONE	<20
CARBON DISULFIDE	<1
1,1-DICHLOROETHENE	<1
1,1-DICHLOROETHANE	<1
1,2-DICHLOROETHENE (TOTAL)	<1
CHLOROFORM	<1
1,2-DICHLOROETHANE	<1
2-BUTANONE (MEK)	<20
1,1,1-TRICHLOROETHANE	<1
CARBON TETRACHLORIDE	<1
VINYL ACETATE	<10
BROMODICHLOROMETHANE	<1
1,1,2,2-TETRACHLOROETHANE	<1
1,2-DICHLOROPROPANE	<1
CIS-1,3-DICHLOROPROPENE	<1
TRICHLOROETHENE	<1
DIBROMOCHLOROMETHANE	<1
1,1,2 TRICHLOROETHANE	<1
BENZENE	<1
TRANS-1,3-DICHLOROPROPENE	<1
BROMOFORM	<5
2-HEXANONE (MBK)	<10
4-METHYL-2-PENTANONE (MIBK)	<10
TETRACHLOROETHENE	<1
TOLUENE	<2
CHLOROBENZENE	<1
ETHYL BENZENE	<1
STYRENE	<1
TOTAL XYLENES	<1

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	88
BFB (%)	103
TOLUENE-D8 (%)	97

Analytical Technologies, Inc.

GCMS - RESULTS

REAGENT BLANK

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

CLIENT : ENGINEERING ENTERPRISES-LONG BEACH

ATI I.D. : 002037

UNITS : UG/L

COMPOUNDS	RESULTS
NONE DETECTED	N/A

Analytical Technologies, Inc. QUALITY CONTROL DATA

ATI I.D. : 002037

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

CLIENT : ENGINEERING ENTERPRISES-LONG BEACH
PROJECT # : 512-345
PROJECT NAME : (NONE
REF I.D. : 00203706

DATE EXTRACTED : N/A
DATE ANALYZED : 02/07/90
SAMPLE MATRIX : WATER
UNITS : UG/L

COMPOUNDS	SAMPLE RESULT	CONC. SPIKED	SPIKED SAMPLE	% REC.	DUP. SPIKED SAMPLE	DUP. % REC.	RPD
1,1-DICHLOROETHENE	<5	250	224	90	220	88	2
TRICHLOROETHENE	625	300	844	73	827	67	9
CHLOROBENZENE	<5	300	294	98	283	94	4
TOLUENE	<5	300	284	95	280	93	2
BENZENE	<5	300	270	90	265	88	2

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Spiked Sample Result} - \text{Duplicate Spike Sample Result})}{\text{Average of Spiked Sample}} \times 100$$

ENGINEERING ENTERPRISES, INC.
21818 WILMINGTON AVE., SUITE 405
LONG BEACH, CA 90810 (213)518-4597

002037

CHAIN OF CUSTODY RECORD

LABORATORY:	PROJECT NO.	PURCHASE ORDER NO.
Analytical Technologies 5550 Morehouse Dr San Diego CA 92121	512-345	
	SAMPLERS:(signature) Scott Martin	
	Phone No. (213)430-6500	

Phone No:

Remarks:

SAMPLE NO.	DATE	TIME	ANALYSES REQUESTED: 624	Number of Containers	REMARKS
W-05-01	2/1/90	a.m.	X	2	SEND REPORT
W-~~05~~ 04-02			X	2	Attention
W-06-03			X	2	BILL HALBERT
W-03-04		P.M.	X	2	
W-02-05			X	2	
W-22-06			X	2	
W-01-07			X	2	

PINK COPY: SAMPLER RETAINS **YELLOW COPY:** LABORATORY COPY

WHITE COPY: LABORATORY SIGNS AND RETURNS WITH ANALYTICAL RESULTS

TOTAL NUMBER OF CONTAINERS: 14

Relinquished by:(signature)	Received by:(signature)	Date/Time
Scott Martin	V.M. Ramirez	2-2-90 14:45
V.M. Ramirez	M. Van Derhoof	2-2-90 18:30
Relinquished by:(signature)	Received for laboratory by:(signature)	Date/Time
		2-2-90 18:30

APPENDIX C

PART III

LABORATORY REPORTS - GROUNDWATER FEBRUARY 21, 1990

AnalyticalTechnologies,Inc. Corporate Offices: 5550 Morehouse Drive San Diego, CA 92121 (619) 458-9141

ATI I.D. 002270

March 8, 1990

Engineering Enterprises, Inc.
6695 East Pacific Coast Highway
Long Beach, California 90803

Project No.: 512-345

Attention: Bill Halbert

On February 22, 1990, Analytical Technologies, Inc. received nine water samples for analysis. The samples were analyzed with EPA methodology or equivalent methods as specified in the attached analytical schedule. The symbol for "less than" indicates a value below the reportable detection limit. Please see the attached sheet for the sample cross reference.

The results of this analysis and the quality control data are enclosed.

Carolyn A. Sites

Carolyn A. Sites
GC/MS Supervisor

Gary A. Stewart

for Richard M. Amano
Laboratory Manager

CAS:eb

Analytical**Technologies**,Inc.

ATI I.D. 002270

ANALYTICAL SCHEDULE

CLIENT: ENGINEERING ENTERPRISES, INC. PROJECT NO.: 512-345
PROJECT NAME: (NONE)

ANALYSIS	TECHNIQUE	REFERENCE/METHOD
VOLATILE ORGANICS	GC/MS	EPA 8240

AnalyticalTechnologies,Inc.

CLIENT	: ENGINEERING ENTERPRISES-LONG BEACH	DATE RECEIVED	: 02/22/90
PROJECT #	: 512-345		
PROJECT NAME	: (NONE)	REPORT DATE	: 03/08/90

ATI I.D. : 002270

ATI #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	OW-5	WATER	02/21/90
02	OW-3	WATER	02/21/90
03	OW-6	WATER	02/21/90
04	OW-2	WATER	02/21/90
05	OW-4	WATER	02/21/90
06	OW-1	WATER	02/21/90
07	OW-00	WATER	02/21/90
08	OW-22	WATER	02/21/90
09	SDTB 869	WATER	02/20/90

----- TOTALS -----

MATRIX	# SAMPLES
WATER	9

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.

AnalyticalTechnologies,Inc.

GCMS - RESULTS

ATI I.D. : 00227001

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

CLIENT	: ENGINEERING ENTERPRISES-LONG BEACH	DATE SAMPLED	: 02/21/90
PROJECT #	: 512-345	DATE RECEIVED	: 02/22/90
PROJECT NAME	: (NONE)	DATE EXTRACTED	: N/A
CLIENT I.D.	: OW-5	DATE ANALYZED	: 02/26/90
SAMPLE MATRIX	: WATER	UNITS	: UG/L
		DILUTION FACTOR	: 80

COMPOUNDS	RESULTS
CHLOROMETHANE	<800
BROMOMETHANE	<800
VINYL CHLORIDE	<80
CHLOROETHANE	<80
METHYLENE CHLORIDE	<400
ACETONE	<1600
CARBON DISULFIDE	<80
1,1-DICHLOROETHENE	130
1,1-DICHLOROETHANE	<80
1,2-DICHLOROETHENE (TOTAL)	380
CHLOROFORM	<80
1,2-DICHLOROETHANE	<80
2-BUTANONE (MEK)	<1600
1,1,1-TRICHLOROETHANE	<80
CARBON TETRACHLORIDE	<80
VINYL ACETATE	<800
BROMODICHLOROMETHANE	<80
1,1,2,2-TETRACHLOROETHANE	<80
1,2-DICHLOROPROPANE	<80
CIS-1,3-DICHLOROPROPENE	<80
TRICHLOROETHENE	15000
DIBROMOCHLOROMETHANE	<80
1,1,2 TRICHLOROETHANE	<80
BENZENE	<80
TRANS-1,3-DICHLOROPROPENE	<80
BROMOFORM	<400
2-HEXANONE (MBK)	<800
4-METHYL-2-PENTANONE (MIBK)	<800
TETRACHLOROETHENE	5900
TOLUENE	<160
CHLOROBENZENE	<80
ETHYL BENZENE	<80
STYRENE	<80
TOTAL XYLENES	<80

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	91
BFB (%)	95
TOLUENE-D8 (%)	93

Analytical Technologies, Inc. ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

ATI I.D. : 00227001

MATRIX : WATER

UNITS : UG/L

COMPOUNDS	RESULTS
NONE DETECTED	N/A

AnalyticalTechnologies,Inc.

GCMS - RESULTS

ATI I.D. : 00227002

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

CLIENT	: ENGINEERING ENTERPRISES-LONG BEACH	DATE SAMPLED	: 02/21/90
PROJECT #	: 512-345	DATE RECEIVED	: 02/22/90
PROJECT NAME	: (NONE)	DATE EXTRACTED	: N/A
CLIENT I.D.	: OW-3	DATE ANALYZED	: 02/26/90
SAMPLE MATRIX	: WATER	UNITS	: UG/L
		DILUTION FACTOR	: 20

COMPOUNDS	RESULTS
CHLOROMETHANE	<200
BROMOMETHANE	<200
VINYL CHLORIDE	<20
CHLOROETHANE	<20
METHYLENE CHLORIDE	<100
ACETONE	<400
CARBON DISULFIDE	<20
1,1-DICHLOROETHENE	35
1,1-DICHLOROETHANE	<20
1,2-DICHLOROETHENE (TOTAL)	150
CHLOROFORM	<20
1,2-DICHLOROETHANE	<20
2-BUTANONE (MEK)	<400
1,1,1-TRICHLOROETHANE	<20
CARBON TETRACHLORIDE	<20
VINYL ACETATE	<200
BROMODICHLOROMETHANE	<20
1,1,2,2-TETRACHLOROETHANE	<20
1,2-DICHLOROPROPANE	<20
CIS-1,3-DICHLOROPROPENE	<20
TRICHLOROETHENE	3800
DIBROMOCHLOROMETHANE	<20
1,1,2 TRICHLOROETHANE	<20
BENZENE	<20
TRANS-1,3-DICHLOROPROPENE	<20
BROMOFORM	<100
2-HEXANONE (MBK)	<200
4-METHYL-2-PENTANONE (MIBK)	<200
TETRACHLOROETHENE	1100
TOLUENE	<40
CHLOROBENZENE	<20
ETHYL BENZENE	<20
STYRENE	<20
TOTAL XYLENES	<20

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	90
BFB (%)	96
TOLUENE-D8 (%)	96

Analytical Technologies, Inc. ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

ATI I.D. : 00227002

MATRIX : WATER

UNITS : UG/L

COMPOUNDS	RESULTS
NONE DETECTED	N/A

AnalyticalTechnologies,Inc.

GCMS - RESULTS

ATI I.D. : 00227003

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

CLIENT	: ENGINEERING ENTERPRISES-LONG BEACH	DATE SAMPLED	: 02/21/90
PROJECT #	: 512-345	DATE RECEIVED	: 02/22/90
PROJECT NAME	: (NONE)	DATE EXTRACTED	: N/A
CLIENT I.D.	: OW-6	DATE ANALYZED	: 02/28/90
SAMPLE MATRIX	: WATER	UNITS	: UG/L
		DILUTION FACTOR	: 40

COMPOUNDS	RESULTS
CHLOROMETHANE	<400
BROMOMETHANE	<400
VINYL CHLORIDE	<40
CHLOROETHANE	<40
METHYLENE CHLORIDE	<200
ACETONE	<800
CARBON DISULFIDE	<40
1,1-DICHLOROETHENE	56
1,1-DICHLOROETHANE	<40
1,2-DICHLOROETHENE (TOTAL)	59
CHLOROFORM	<40
1,2-DICHLOROETHANE	<40
2-BUTANONE (MEK)	<800
1,1,1-TRICHLOROETHANE	<40
CARBON TETRACHLORIDE	<40
VINYL ACETATE	<400
BROMODICHLOROMETHANE	<40
1,1,2,2-TETRACHLOROETHANE	<40
1,2-DICHLOROPROPANE	<40
CIS-1,3-DICHLOROPROPENE	<40
TRICHLOROETHENE	7800
DIBROMOCHLOROMETHANE	<40
1,1,2 TRICHLOROETHANE	<40
BENZENE	<40
TRANS-1,3-DICHLOROPROPENE	<40
BROMOFORM	<200
2-HEXANONE (MBK)	<400
4-METHYL-2-PENTANONE (MIBK)	<400
TETRACHLOROETHENE	3300
TOLUENE	<80
CHLOROBENZENE	2800
ETHYL BENZENE	<40
STYRENE	<40
TOTAL XYLENES	210

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	87
BFB (%)	98
TOLUENE-D8 (%)	97

Analytical Technologies, Inc. ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

ATI I.D. : 00227003

MATRIX : WATER

UNITS : UG/L

COMPOUNDS	RESULTS
NONE DETECTED	N/A

AnalyticalTechnologies,Inc.

GCMS - RESULTS

ATI I.D. : 00227004

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

CLIENT	: ENGINEERING ENTERPRISES-LONG BEACH	DATE SAMPLED	: 02/21/90
PROJECT #	: 512-345	DATE RECEIVED	: 02/22/90
PROJECT NAME	: (NONE)	DATE EXTRACTED	: N/A
CLIENT I.D.	: OW-2	DATE ANALYZED	: 03/01/90
SAMPLE MATRIX	: WATER	UNITS	: UG/L
		DILUTION FACTOR	: 5

COMPOUNDS	RESULTS
CHLOROMETHANE	<50
BROMOMETHANE	<50
VINYL CHLORIDE	<5
CHLOROETHANE	<5
METHYLENE CHLORIDE	<25
ACETONE	<100
CARBON DISULFIDE	<5
1,1-DICHLOROETHENE	<5
1,1-DICHLOROETHANE	<5
1,2-DICHLOROETHENE (TOTAL)	6
CHLOROFORM	<5
1,2-DICHLOROETHANE	<5
2-BUTANONE (MEK)	<100
1,1,1-TRICHLOROETHANE	<5
CARBON TETRACHLORIDE	<5
VINYL ACETATE	<50
BROMODICHLOROMETHANE	<5
1,1,2,2-TETRACHLOROETHANE	<5
1,2-DICHLOROPROPANE	<5
CIS-1,3-DICHLOROPROPENE	<5
TRICHLOROETHENE	1100
DIBROMOCHLOROMETHANE	<5
1,1,2 TRICHLOROETHANE	<5
BENZENE	<5
TRANS-1,3-DICHLOROPROPENE	<5
BROMOFORM	<25
2-HEXANONE (MBK)	<50
4-METHYL-2-PENTANONE (MIBK)	<50
TETRACHLOROETHENE	160
TOLUENE	<10
CHLOROBENZENE	<5
ETHYL BENZENE	<5
STYRENE	<5
TOTAL XYLENES	<5

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	93
BFB (%)	107
TOLUENE-D8 (%)	105

Analytical Technologies, Inc. ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

ATI I.D. : 00227004

MATRIX : WATER

UNITS : UG/L

COMPOUNDS	RESULTS
145 ALIPHATIC HYDROCARBON C4	270
193 ALIPHATIC HYDROCARBON C4	290

AnalyticalTechnologies,Inc.

GCMS - RESULTS

ATI I.D. : 00227005

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

CLIENT	: ENGINEERING ENTERPRISES-LONG BEACH	DATE SAMPLED	: 02/21/90
PROJECT #	: 512-345	DATE RECEIVED	: 02/22/90
PROJECT NAME	: (NONE)	DATE EXTRACTED	: N/A
CLIENT I.D.	: OW-4	DATE ANALYZED	: 03/01/90
SAMPLE MATRIX	: WATER	UNITS	: UG/L
		DILUTION FACTOR	: 15

COMPOUNDS	RESULTS
CHLOROMETHANE	<150
BROMOMETHANE	<150
VINYL CHLORIDE	<15
CHLOROETHANE	<15
METHYLENE CHLORIDE	<75
ACETONE	<300
CARBON DISULFIDE	<15
1,1-DICHLOROETHENE	<15
1,1-DICHLOROETHANE	<15
1,2-DICHLOROETHENE (TOTAL)	87
CHLOROFORM	<15
1,2-DICHLOROETHANE	<15
2-BUTANONE (MEK)	<300
1,1,1-TRICHLOROETHANE	<15
CARBON TETRACHLORIDE	<15
VINYL ACETATE	<150
BROMODICHLOROMETHANE	<15
1,1,2,2-TETRACHLOROETHANE	<15
1,2-DICHLOROPROPANE	<15
CIS-1,3-DICHLOROPROPENE	<15
TRICHLOROETHENE	3400
DIBROMOCHLOROMETHANE	<15
1,1,2 TRICHLOROETHANE	<15
BENZENE	<15
TRANS-1,3-DICHLOROPROPENE	<15
BROMOFORM	<75
2-HEXANONE (MBK)	<150
4-METHYL-2-PENTANONE (MIBK)	<150
TETRACHLOROETHENE	400
TOLUENE	<30
CHLOROBENZENE	<15
ETHYL BENZENE	<15
STYRENE	<15
TOTAL XYLENES	<15

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	89
BFB (%)	102
TOLUENE-D8 (%)	100

Analytical**Technologies,**Inc. ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

ATI I.D. : 00227005

MATRIX : WATER

UNITS : UG/L

COMPOUNDS	RESULTS
NONE DETECTED	N/A

AnalyticalTechnologies,Inc.

GCMS - RESULTS

ATI I.D. : 00227006

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

CLIENT	: ENGINEERING ENTERPRISES-LONG BEACH	DATE SAMPLED	: 02/21/90
PROJECT #	: 512-345	DATE RECEIVED	: 02/22/90
PROJECT NAME	: (NONE)	DATE EXTRACTED	: N/A
CLIENT I.D.	: OW-1	DATE ANALYZED	: 03/01/90
SAMPLE MATRIX	: WATER	UNITS	: UG/L
		DILUTION FACTOR	: 1500

COMPOUNDS	RESULTS
CHLOROMETHANE	<15000
BROMOMETHANE	<15000
VINYL CHLORIDE	<1500
CHLOROETHANE	<1500
METHYLENE CHLORIDE	190000
ACETONE	<30000
CARBON DISULFIDE	<1500
1,1-DICHLOROETHENE	<1500
1,1-DICHLOROETHANE	<1500
1,2-DICHLOROETHENE (TOTAL)	<1500
CHLOROFORM	<1500
1,2-DICHLOROETHANE	<1500
2-BUTANONE (MEK)	<30000
1,1,1-TRICHLOROETHANE	<1500
CARBON TETRACHLORIDE	<1500
VINYL ACETATE	<15000
BROMODICHLOROMETHANE	<1500
1,1,2,2-TETRACHLOROETHANE	<1500
1,2-DICHLOROPROPANE	<1500
CIS-1,3-DICHLOROPROPENE	<1500
TRICHLOROETHENE	2200
DIBROMOCHLOROMETHANE	<1500
1,1,2 TRICHLOROETHANE	<1500
BENZENE	<1500
TRANS-1,3-DICHLOROPROPENE	<1500
BROMOFORM	<7500
2-HEXANONE (MBK)	<15000
4-METHYL-2-PENTANONE (MIBK)	<15000
TETRACHLOROETHENE	<1500
TOLUENE	<3000
CHLOROBENZENE	<1500
ETHYL BENZENE	<1500
STYRENE	<1500
TOTAL XYLENES	<1500

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	87
BFB (%)	98
TOLUENE-D8 (%)	97

AnalyticalTechnologies,Inc.

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

ATI I.D. : 00227006

MATRIX : WATER

UNITS : UG/L

COMPOUNDS	RESULTS
NONE DETECTED	N/A

Analytical**Technologies**,Inc.

GCMS - RESULTS

ATI I.D. : 00227007

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

CLIENT	: ENGINEERING ENTERPRISES-LONG BEACH	DATE SAMPLED	: 02/21/90
PROJECT #	: 512-345	DATE RECEIVED	: 02/22/90
PROJECT NAME	: (NONE)	DATE EXTRACTED	: N/A
CLIENT I.D.	: OW-00	DATE ANALYZED	: 02/26/90
SAMPLE MATRIX	: WATER	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROMETHANE	<10
BROMOMETHANE	<10
VINYL CHLORIDE	<1
CHLOROETHANE	<1
METHYLENE CHLORIDE	<5
ACETONE	<20
CARBON DISULFIDE	<1
1,1-DICHLOROETHENE	<1
1,1-DICHLOROETHANE	<1
1,2-DICHLOROETHENE (TOTAL)	<1
CHLOROFORM	<1
1,2-DICHLOROETHANE	<1
2-BUTANONE (MEK)	<20
1,1,1-TRICHLOROETHANE	<1
CARBON TETRACHLORIDE	<1
VINYL ACETATE	<10
BROMODICHLOROMETHANE	<1
1,1,2,2-TETRACHLOROETHANE	<1
1,2-DICHLOROPROPANE	<1
CIS-1,3-DICHLOROPROPENE	<1
TRICHLOROETHENE	<1
DIBROMOCHLOROMETHANE	<1
1,1,2 TRICHLOROETHANE	<1
BENZENE	<1
TRANS-1,3-DICHLOROPROPENE	<1
BROMOFORM	<5
2-HEXANONE (MBK)	<10
4-METHYL-2-PENTANONE (MIBK)	<10
TETRACHLOROETHENE	<1
TOLUENE	<2
CHLOROBENZENE	<1
ETHYL BENZENE	<1
STYRENE	<1
TOTAL XYLENES	<1

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	98
BFB (%)	93
TOLUENE-D8 (%)	96

Analytical Technologies, Inc. ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

ATI I.D. : 00227007

MATRIX : WATER

UNITS : UG/L

COMPOUNDS	RESULTS
NONE DETECTED	N/A

AnalyticalTechnologies,Inc.

GCMS - RESULTS

ATI I.D. : 00227008

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

CLIENT	: ENGINEERING ENTERPRISES-LONG BEACH	DATE SAMPLED	: 02/21/90
PROJECT #	: 512-345	DATE RECEIVED	: 02/22/90
PROJECT NAME	: (NONE)	DATE EXTRACTED	: N/A
CLIENT I.D.	: OW-22	DATE ANALYZED	: 03/01/90
SAMPLE MATRIX	: WATER	UNITS	: UG/L
		DILUTION FACTOR	: 100

COMPOUNDS	RESULTS
CHLOROMETHANE	<1000
BROMOMETHANE	<1000
VINYL CHLORIDE	<100
CHLOROETHANE	<100
METHYLENE CHLORIDE	<500
ACETONE	<2000
CARBON DISULFIDE	<100
1,1-DICHLOROETHENE	100
1,1-DICHLOROETHANE	<100
1,2-DICHLOROETHENE (TOTAL)	380
CHLOROFORM	<100
1,2-DICHLOROETHANE	<100
2-BUTANONE (MEK)	<2000
1,1,1-TRICHLOROETHANE	<100
CARBON TETRACHLORIDE	<100
VINYL ACETATE	<1000
BROMODICHLOROMETHANE	<100
1,1,2,2-TETRACHLOROETHANE	<100
1,2-DICHLOROPROPANE	<100
CIS-1,3-DICHLOROPROPENE	<100
TRICHLOROETHENE	16000
DIBROMOCHLOROMETHANE	<100
1,1,2 TRICHLOROETHANE	<100
BENZENE	<100
TRANS-1,3-DICHLOROPROPENE	<100
BROMOFORM	<500
2-HEXANONE (MBK)	<1000
4-METHYL-2-PENTANONE (MIBK)	<1000
TETRACHLOROETHENE	5100
TOLUENE	<200
CHLOROBENZENE	<100
ETHYL BENZENE	<100
STYRENE	<100
TOTAL XYLENES	<100

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	86
BFB (%)	100
TOLUENE-D8 (%)	99

Analytical**Technologies,**Inc. ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

ATI I.D. : 00227008

MATRIX : WATER

UNITS : UG/L

COMPOUNDS	RESULTS
NONE DETECTED	N/A

AnalyticalTechnologies,Inc.

GCMS - RESULTS

ATI I.D. : 00227009

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

CLIENT	: ENGINEERING ENTERPRISES-LONG BEACH	DATE SAMPLED	: 02/20/90
PROJECT #	: 512-345	DATE RECEIVED	: 02/22/90
PROJECT NAME	: (NONE)	DATE EXTRACTED	: N/A
CLIENT I.D.	: SDTB 869	DATE ANALYZED	: 02/26/90
SAMPLE MATRIX	: WATER	UNITS	: UG/L
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
CHLOROMETHANE	<10
BROMOMETHANE	<10
VINYL CHLORIDE	<1
CHLOROETHANE	<1
METHYLENE CHLORIDE	<5
ACETONE	<20
CARBON DISULFIDE	<1
1,1-DICHLOROETHENE	<1
1,1-DICHLOROETHANE	<1
1,2-DICHLOROETHENE (TOTAL)	<1
CHLOROFORM	<1
1,2-DICHLOROETHANE	<1
2-BUTANONE (MEK)	<20
1,1,1-TRICHLOROETHANE	<1
CARBON TETRACHLORIDE	<1
VINYL ACETATE	<10
BROMODICHLOROMETHANE	<1
1,1,2,2-TETRACHLOROETHANE	<1
1,2-DICHLOROPROPANE	<1
CIS-1,3-DICHLOROPROPENE	<1
TRICHLOROETHENE	<1
DIBROMOCHLOROMETHANE	<1
1,1,2 TRICHLOROETHANE	<1
BENZENE	<1
TRANS-1,3-DICHLOROPROPENE	<1
BROMOFORM	<5
2-HEXANONE (MBK)	<10
4-METHYL-2-PENTANONE (MIBK)	<10
TETRACHLOROETHENE	<1
TOLUENE	<2
CHLOROBENZENE	<1
ETHYL BENZENE	<1
STYRENE	<1
TOTAL XYLENES	<1

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	94
BFB (%)	94
TOLUENE-D8 (%)	97

Analytical Technologies, Inc. ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

ATI I.D. : 00227009

MATRIX : WATER

UNITS : UG/L

COMPOUNDS	RESULTS
NONE DETECTED	N/A

Analytical Technologies, Inc.

GCMS - RESULTS

REAGENT BLANK

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

		ATI I.D.	: 002270
CLIENT	: ENGINEERING ENTERPRISES-LONG BEACH	DATE EXTRACTED	: N/A
PROJECT #	: 512-345	DATE ANALYZED	: 02/26/90
PROJECT NAME	: (NONE)	UNITS	: UG/L
CLIENT I.D.	: REAGENT BLANK	DILUTION FACTOR	: N/A

COMPOUNDS	RESULTS
CHLOROMETHANE	<10
BROMOMETHANE	<10
VINYL CHLORIDE	<1
CHLOROETHANE	<1
METHYLENE CHLORIDE	<5
ACETONE	<20
CARBON DISULFIDE	<1
1,1-DICHLOROETHENE	<1
1,1-DICHLOROETHANE	<1
1,2-DICHLOROETHENE (TOTAL)	<1
CHLOROFORM	<1
1,2-DICHLOROETHANE	<1
2-BUTANONE (MEK)	<20
1,1,1-TRICHLOROETHANE	<1
CARBON TETRACHLORIDE	<1
VINYL ACETATE	<10
BROMODICHLOROMETHANE	<1
1,1,2,2-TETRACHLOROETHANE	<1
1,2-DICHLOROPROPANE	<1
CIS-1,3-DICHLOROPROPENE	<1
TRICHLOROETHENE	<1
DIBROMOCHLOROMETHANE	<1
1,1,2 TRICHLOROETHANE	<1
BENZENE	<1
TRANS-1,3-DICHLOROPROPENE	<1
BROMOFORM	<5
2-HEXANONE (MBK)	<10
4-METHYL-2-PENTANONE (MIBK)	<10
TETRACHLOROETHENE	<1
TOLUENE	<2
CHLOROBENZENE	<1
ETHYL BENZENE	<1
STYRENE	<1
TOTAL XYLENES	<1

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	95
BFB (%)	98
TOLUENE-D8 (%)	101

Analytical Technologies, Inc.

GCMS - RESULTS

REAGENT BLANK

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

CLIENT : ENGINEERING ENTERPRISES-LONG BEACH

ATI I.D. : 002270

UNITS : UG/L

COMPOUNDS	RESULTS
NONE DETECTED	N/A

Analytical**Technologies**,Inc.

GCMS - RESULTS

REAGENT BLANK

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

CLIENT	: ENGINEERING ENTERPRISES-LONG BEACH	ATI I.D.	: 002270
PROJECT #	: 512-345	DATE EXTRACTED	: N/A
PROJECT NAME	: (NONE)	DATE ANALYZED	: 02/27/90
CLIENT I.D.	: REAGENT BLANK	UNITS	: UG/L
		DILUTION FACTOR	: N/A

COMPOUNDS	RESULTS
CHLOROMETHANE	<10
BROMOMETHANE	<10
VINYL CHLORIDE	<1
CHLOROETHANE	<1
METHYLENE CHLORIDE	<5
ACETONE	<20
CARBON DISULFIDE	<1
1,1-DICHLOROETHENE	<1
1,1-DICHLOROETHANE	<1
1,2-DICHLOROETHENE (TOTAL)	<1
CHLOROFORM	<1
1,2-DICHLOROETHANE	<1
2-BUTANONE (MEK)	<20
1,1,1-TRICHLOROETHANE	<1
CARBON TETRACHLORIDE	<1
VINYL ACETATE	<10
BROMODICHLOROMETHANE	<1
1,1,2,2-TETRACHLOROETHANE	<1
1,2-DICHLOROPROPANE	<1
CIS-1,3-DICHLOROPROPENE	<1
TRICHLOROETHENE	<1
DIBROMOCHLOROMETHANE	<1
1,1,2 TRICHLOROETHANE	<1
BENZENE	<1
TRANS-1,3-DICHLOROPROPENE	<1
BROMOFORM	<5
2-HEXANONE (MBK)	<10
4-METHYL-2-PENTANONE (MIBK)	<10
TETRACHLOROETHENE	<1
TOLUENE	<2
CHLOROBENZENE	<1
ETHYL BENZENE	<1
STYRENE	<1
TOTAL XYLENES	<1

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	88
BFB (%)	91
TOLUENE-D8 (%)	94

Analytical Technologies, Inc. GCMS - RESULTS

REAGENT BLANK

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

CLIENT : ENGINEERING ENTERPRISES-LONG BEACH ATI I.D. : 002270

UNITS : UG/L

COMPOUNDS	RESULTS
NONE DETECTED	N/A

AnalyticalTechnologies,Inc. GCMS - RESULTS

REAGENT BLANK

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

		ATI I.D.	: 002270
CLIENT	: ENGINEERING ENTERPRISES-LONG BEACH	DATE EXTRACTED	: N/A
PROJECT #	: 512-345	DATE ANALYZED	: 03/01/90
PROJECT NAME	: (NONE)	UNITS	: UG/L
CLIENT I.D.	: REAGENT BLANK	DILUTION FACTOR	: N/A

COMPOUNDS	RESULTS
CHLOROMETHANE	<10
BROMOMETHANE	<10
VINYL CHLORIDE	<1
CHLOROETHANE	<1
METHYLENE CHLORIDE	TR <5
ACETONE	<20
CARBON DISULFIDE	<1
1,1-DICHLOROETHENE	<1
1,1-DICHLOROETHANE	<1
1,2-DICHLOROETHENE (TOTAL)	<1
CHLOROFORM	<1
1,2-DICHLOROETHANE	<1
2-BUTANONE (MEK)	<20
1,1,1-TRICHLOROETHANE	<1
CARBON TETRACHLORIDE	<1
VINYL ACETATE	<10
BROMODICHLOROMETHANE	<1
1,1,2,2-TETRACHLOROETHANE	<1
1,2-DICHLOROPROPANE	<1
CIS-1,3-DICHLOROPROPENE	<1
TRICHLOROETHENE	<1
DIBROMOCHLOROMETHANE	<1
1,1,2 TRICHLOROETHANE	<1
BENZENE	<1
TRANS-1,3-DICHLOROPROPENE	<1
BROMOFORM	<5
2-HEXANONE (MBK)	<10
4-METHYL-2-PENTANONE (MIBK)	<10
TETRACHLOROETHENE	<1
TOLUENE	<2
CHLOROBENZENE	<1
ETHYL BENZENE	<1
STYRENE	<1
TOTAL XYLENES	<1

SURROGATE PERCENT RECOVERIES

1,2-DICHLOROETHANE-D4 (%)	95
BFB (%)	102
TOLUENE-D8 (%)	105

TR - Compound detected at an unquantifiable trace level

Analytical**Technologies,**Inc. GCMS - RESULTS

REAGENT BLANK

ADDITIONAL COMPOUNDS (SEMI-QUANTITATED)

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

CLIENT : ENGINEERING ENTERPRISES-LONG BEACH

ATI I.D. : 002270

UNITS : UG/L

COMPOUNDS	RESULTS
NONE DETECTED	N/A

AnalyticalTechnologies,Inc.

QUALITY CONTROL DATA

ATI I.D. : 002270

TEST : EPA 8240 (GC/MS FOR VOLATILE ORGANICS)

CLIENT	: ENGINEERING ENTERPRISES-LONG BEACH		DATE EXTRACTED	: N/A
PROJECT #	: 512-345		DATE ANALYZED	: 03/02/90
PROJECT NAME	: (NONE)		SAMPLE MATRIX	: WATER
REF I.D.	: 00227006		UNITS	: UG/L

COMPOUNDS	SAMPLE RESULT	CONC. SPIKED	SPIKED SAMPLE	% REC.	DUP. SPIKED SAMPLE	DUP. % REC.	RPD
1,1-DICHLOROETHENE	<1500	75000	71000	95	68000	91	4
TRICHLOROETHENE	2200	90000	90000	98	90000	98	0
CHLOROBENZENE	<1500	90000	90000	100	90000	100	0
TOLUENE	<1500	90000	85000	94	83000	92	2
BENZENE	<1500	90000	81000	90	80000	89	1

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Spiked Sample Result} - \text{Duplicate Spike Sample Result})}{\text{Average of Spiked Sample}} \times 100$$

002270

ENGINEERING ENTERPRISES, INC.
21818 WILMINGTON AVE., SUITE 405
LONG BEACH, CA 90810 (213)518-4597

CHAIN OF CUSTODY RECORD

LABORATORY: Analytical Technologies Inc. - 5550 Morehouse Dr. San Diego, Ca. 92121-1709

PROJECT NO. 512-345

PURCHASE ORDER NO.

SAMPLERS:(signature) LChnoz

Phone No. 213/ 430-6500

Phone No: (619) 458-9141

Remarks:

ANALYSES REQUESTED

SAMPLE NO.	DATE	TIME	624	Number of Containers	REMARKS Lab. report attn: Bill Halbert.
OW-5-01	2/21/90	AM	X	1	
OW-5-02	2/21			1	Duplicate
OW-3-01	2/21		X	1	
OW-3-02	2/21			1	Duplicate
OW-6-01	2/21		X	1	
OW-6-02	2/21			1	Duplicate
OW-2-01	2/21	PM	X	1	
OW-2-02	2/21			1	Duplicate
OW-4-01	2/21		X	1	
OW-4-02	2/21			1	Duplicate
OW-1-01	2/21		X	1	
OW-1-02	2/21			1	Duplicate
OW-00-01	2/21		X	1	
OW-00-02	2/21			1	Duplicate
SPTB 869	2/21			1	

PINK COPY: SAMPLER RETAINS **YELLOW COPY:** LABORATORY COPY

WHITE COPY: LABORATORY SIGNS AND RETURNS WITH ANALYTICAL RESULTS

TOTAL NUMBER OF CONTAINERS: 15

Relinquished by:(signature)	Received by:(signature)	Date/Time
Leobardo Chaidez	[signature]	2/22 2:45
Relinquished by:(signature)	Received by:(signature)	Date/Time
Relinquished by:(signature)	Received by:(signature)	Date/Time
Relinquished by:(signature)	Received for laboratory by:(signature)	Date/Time
[signature]	Christie Tovalo	2/22 11:50

EEI ENGINEERING ENTERPRISES, INC.
21818 WILMINGTON AVE., SUITE 405
LONG BEACH, CA 90810 (213)518-4597

CHAIN OF CUSTODY RECORD

LABORATORY: Analytical Technologies Inc.
5550 Morehouse Dr.
San Diego, CA. 92121-1709

PROJECT NO. 512-345

PURCHASE ORDER NO.

SAMPLERS:(signature) L Chaidez

Phone No. 213/430-6500

Phone No: 619/458-9141

Remarks:

ANALYSES REQUESTED

SAMPLE NO.	DATE	TIME	624	Number of Containers	REMARKS
OW-22-01	02-21-90	AM	X	1	
OW-22-02				1	Duplicate
					Send Lab report at Bill Hallrert!

PINK COPY: SAMPLER RETAINS YELLOW COPY: LABORATORY COPY

WHITE COPY: LABORATORY SIGNS AND RETURNS WITH ANALYTICAL RESULTS

TOTAL NUMBER OF CONTAINERS: 02

Relinquished by:(signature)	Received by:(signature)	Date/Time
Leovardo Chaidez	[signature]	2/22 2:45
Relinquished by:(signature)	Received by:(signature)	Date/Time
Relinquished by:(signature)	Received by:(signature)	Date/Time
Relinquished by:(signature)	Received for laboratory by:(signature) Christine Tonalo	2/22 7:50

ENGINEERING ENTERPRISES, INC.

WATER RESOURCES SPECIALISTS

6695 E. Pacific Coast Highway Long Beach, CA 90803 213-430-6500

April 10, 1990

Amoco Chemical Company
PO Box 3385
Tulsa, Oklahoma 74102

Attention: Mr. Bob Hockman
Environmental Coordinator

Subject: Cost Breakdown by Task
Additional Subsurface Assessment
1225 West 196th Street
Torrance, California
Project No. 512-345

Dear Bob:

As you requested, a cost breakdown by task is presented below. I have broken the job into three tasks - 1) groundwater investigation, 2) soil investigation, and 3) reporting. The cost breakdown for the enclosed invoice is as follows:

Groundwater Investigation	
Personnel	$ 366.00
Equipment	37.91
Laboratory	1,749.00
Soil Investigation	
Laboratory	$2,986.50
Reporting	
Personnel	$3,110.00
Total	$8,249.41

We trust this cost breakdown meets your requirements. If you should have further questions regarding billing, please contact me.

Respectfully,

William E. Halbert
Project Hydrogeologist

ENGINEERING ENTERPRISES, INC.
1225 West Main Street
Norman, Oklahoma 73069
FIN 73-0933839 (405)329-8300

Project: 512-345-00 AMOCO Chemical
SERVICES & REIMB COSTS

Invoice No. 4613
April 12, 1990
Page number 1

AMOCO CORP.
MR. BOB HOCKMAN
P.O. BOX 3385
TULSA OK 74102

PROFESSIONAL SERVICES PERIOD ENDING APRIL 1, 1990

Professional Services	Date	Hours	Rate	Amount
ENGINEERING & TECH. STAFF				
Boughter, Jay A.				
.	3-11-90	3.00	67.00	201.00
Talbert, William				
.	3-18-90	12.00	74.00	888.00
	3-25-90	12.00	74.00	888.00
	4-01-90	6.00	74.00	444.00
Lee, Calvin F.				
.	3-11-90	3.00	55.00	165.00
Tinoco, Luan A.				
.	3-18-90	4.00	49.00	196.00
	3-25-90	8.00	49.00	392.00
	4-01-90	1.00	49.00	49.00
SECRETARIAL				
Clark, Kristin				
.	4-01-90	1.00	44.00	44.00
Gonzales, Melba A.				
.	4-01-90	.50	44.00	22.00
Lihang, April				
.	3-25-90	1.00	34.00	34.00
	4-01-90	2.50	34.00	85.00

Project: 512-345-00 AMOCO Chemical
SERVICES & REIMB COSTS

Invoice No. 4613
April 12, 1990

Professional Services

	Date	Hours	Rate	Amount	
Woolsey, Christine M.					
.	4-01-90	2.00	34.00	68.00	
Services Total:		56.00		3,476.00	3,476.00

Reimbursable Expenses

	Date	Cost	Multiplier	Amount	
MTRL & SERVICES					
Las Palmas #4078	2-01-90	21.71	1.100	23.88	
Las Palmas #4080	2-01-90	12.75	1.100	14.03	
Anal Tech #5850	3-01-90	1,590.00	1.100	1,749.00	
Analyt. Tech #5923	3-08-90	2,715.00	1.100	2,986.50	
MTRL & SERVICES total				4,773.41	
Reimbursable total:				4,773.41	4,773.41
Current Charges:					8,249.41

EEI ENGINEERING ENTERPRISES, INC.

Week Ending: 3-11-90

Employee No.: 6080 Name: Jay Boughter Signature:

Project No.: 512-345 Project Name: AMOCO Torrance

TIME REPORT

Date	Hours	Description of Work Performed
3-9	3	Surveyed monitoring well elevations
TOTAL	3	

EXPENSE REPORT

Date	Breakfast	Lunch	Dinner	Motel	Auto Rent Airfare	Gas	Miles Driven	Mileage Claim	Amount	Other Expenses With Description & Remarks, Location, etc.
TOTALS										

APPROVAL

By WEA Date 3/12

TOTAL EXPENSES	
NET REIMBURSEMENT	

FOR ACCOUNTING USE ONLY

Accounting No.	Function Code	Project No.	Amount

WHITE-Accounting (payroll) CANARY-Client PINK-Accounting (expenses) GOLDENROD-Project Managers

EEI ENGINEERING ENTERPRISES, INC.

Week Ending E 3-18-90

Employee No.: 6360 Name: W. HALBERT Signature:

Project No.: 512-345 Project Name: Amoco Toliance

TIME REPORT

Date	Hours	Description of Work Performed
3-14	6	Figure Preparation
3-15	6	Report Preparation
TOTAL	12	

EXPENSE REPORT

Date	Breakfast	Lunch	Dinner	Motel	Auto Rent Airfare	Gas	Miles Driven	Mileage Claim	Amount	Other Expenses With Description & Remarks, Location, etc.
TOTALS										

APPROVAL

By GEH Date 3-21

TOTAL EXPENSES	
NET REIMBURSEMENT	

FOR ACCOUNTING USE ONLY

Accounting No.	Function Code	Project No.	Amount

WHITE-Accounting (payroll) CANARY-Client PINK-Accounting (expenses) GOLDENROD-Project Managers

EEI ENGINEERING ENTERPRISES, INC.

Week Ending 3-25-90

Employee No.: 6360 Name: HALBERT Signature:

Project No.: 512-345 Project Name: AMOCO - TORRANCE

TIME REPORT

Date	Hours	Description of Work Performed
3-17	8	Report preparation
3-20	4	Review corrections
TOTAL	12	

EXPENSE REPORT

Date	Breakfast	Lunch	Dinner	Motel	Auto Rent Airfare	Gas	Miles Driven	Mileage Claim	Amount	Other Expenses With Description & Remarks, Location, etc.
TOTALS										

APPROVAL

By WEH Date 3-26-90

TOTAL EXPENSES	
NET REIMBURSEMENT	

FOR ACCOUNTING USE ONLY

Accounting No.	Function Code	Project No.	Amount

WHITE-Accounting (payroll) CANARY-Client PINK-Accounting (expenses) GOLDENROD-Project Managers

EEI ENGINEERING ENTERPRISES, INC.

Week Ending 4-1-90

Employee No.: 6360 Name: W. HALBERT Signature:

Project No.: 512-345 Project Name: AMOCO CHEMICAL

TIME REPORT

Date	Hours	Description of Work Performed
3-26	4	Revise DRAFT Report And Send out
3-30	2	Breakdown Invoice per Bob Hockman
TOTAL	6	

EXPENSE REPORT

Date	Breakfast	Lunch	Dinner	Motel	Auto Rent Airfare	Gas	Miles Driven	Mileage Claim	Amount	Other Expenses With Description & Remarks, Location, etc.
TOTALS										

APPROVAL

By WEH Date 4-2-90

TOTAL EXPENSES	
NET REIMBURSEMENT	

FOR ACCOUNTING USE ONLY

Accounting No.	Function Code	Project No.	Amount

WHITE-Accounting (payroll) CANARY-Client PINK-Accounting (expenses) GOLDENROD-Project Managers

EEI ENGINEERING ENTERPRISES, INC.

Week Ending 3-11-90

Employee No.: 6538 Name: CALVIN LEE Signature: Calvin Lee

Project No.: 512-345. Project Name: AMOCO

TIME REPORT

Date	Hours	Description of Work Performed
3/9	3.0	SURVEYING
TOTAL	3.0	

EXPENSE REPORT

Date	Breakfast	Lunch	Dinner	Motel	Auto Rent Airfare	Gas	Miles Driven	Mileage Claim	Amount	Other Expenses With Description & Remarks, Location, etc.
TOTALS										

APPROVAL

By [signature] Date 3-12

TOTAL EXPENSES	
NET REIMBURSEMENT	

FOR ACCOUNTING USE ONLY

Accounting No.	Function Code	Project No.	Amount

WHITE-Accounting (payroll) CANARY-Client PINK-Accounting (expenses) GOLDENROD-Project Managers

EEI ENGINEERING ENTERPRISES, INC.

Week Ending 0-3-18-1990 (handwritten "3" above the date)

Employee No.: 6732 Name: LUAN A. TINOCO Signature: Luan A. Tinoc

[cut off]ject No.: 512-345 Project Name: AMOCO

TIME REPORT

Date	Hours	Description of Work Performed
3/15	2	DRAFT AND PLOT MONITORING WELL LOCATION MAPS
3/16	2	DRAFT 1,2 DIC and Groundwater contour maps
TOTAL	4	

EXPENSE REPORT

Date	Breakfast	Lunch	Dinner	Motel	Auto Rent Airfare	Gas	Miles Driven	Mileage Claim	Amount	Other Expenses With Description & Remarks, Location, etc.
										?
TOTALS										

APPROVAL

By WEH Date 3-21

TOTAL EXPENSES	
NET REIMBURSEMENT	

FOR ACCOUNTING USE ONLY

Accounting No.	Function Code	Project No.	Amount

WHITE-Accounting (payroll) CANARY-Client PINK-Accounting (expenses) GOLDENROD-Project Managers

EEI ENGINEERING ENTERPRISES, INC.

Week Ending 3/25/1990

Employee No.: 6732 Name: LUAN A. TINOCO Signature: Luan A. Tinoco

Project No.: 512-345 Project Name:

TIME REPORT

Date	Hours	Description of Work Performed
3/19	6.0	DRAFT TETRACHLORETHENE 1,2 DICHLORETHENE, TRICHLOROETHENE CONTOUR MAP (X2)
3/20	2.0	DRAFT RELATIVE GROUNDWATER CONTOUR MAPS (X2)
TOTAL	8.0	

EXPENSE REPORT

Date	Breakfast	Lunch	Dinner	Motel	Auto Rent Airfare	Gas	Miles Driven	Mileage Claim	Amount	Other Expenses With Description & Remarks, Location, etc.
TOTALS										

APPROVAL

By WEH Date 3-26-90

TOTAL EXPENSES	
NET REIMBURSEMENT	

FOR ACCOUNTING USE ONLY

Accounting No.	Function Code	Project No.	Amount

WHITE-Accounting (payroll) CANARY-Client PINK-Accounting (expenses) GOLDENROD-Project Managers

EEI ENGINEERING ENTERPRISES, INC.

Week Ending 4-1-1990

Employee No.: 6732 Name: LUAN A. TINOCO Signature: Luan A. Tinoco

Project No.: 512-345 Project Name: AMOCO

TIME REPORT

Date	Hours	Description of Work Performed
3/26	1.0	DRAFT BORING AND MONITORING WELL LOCATION MAP AND MINOR REVISIONS TO FIG #1 SITE LOCATION MAP
TOTAL	1.0	

EXPENSE REPORT

Date	Breakfast	Lunch	Dinner	Motel	Auto Rent Airfare	Gas	Miles Driven	Mileage Claim	Amount	Other Expenses With Description & Remarks, Location, etc.
TOTALS										

APPROVAL

By WEP Date 4-2-90

TOTAL EXPENSES	
NET REIMBURSEMENT	

FOR ACCOUNTING USE ONLY

Accounting No.	Function Code	Project No.	Amount

WHITE-Accounting (payroll) CANARY-Client PINK-Accounting (expenses) GOLDENROD-Project Managers

EEI ENGINEERING ENTERPRISES, INC.

Week Ending ~~3~~ 4/1/90

Employee No.: 6170 Name: Kristin Clark Signature:

Project No.: 512-345 Project Name: Amoco

TIME REPORT

Date	Hours	Description of Work Performed
3/26	1	report coordination; compile report for Draft copies
TOTAL	1	

EXPENSE REPORT

Date	Breakfast	Lunch	Dinner	Motel	Auto Rent Airfare	Gas	Miles Driven	Mileage Claim	Amount	Other Expenses With Description & Remarks, Location, etc.
TOTALS										

APPROVAL

By WCH Date 4-2-90

TOTAL EXPENSES	
NET REIMBURSEMENT	

FOR ACCOUNTING USE ONLY

Accounting No.	Function Code	Project No.	Amount

WHITE-Accounting (payroll) CANARY-Client PINK-Accounting (expenses) GOLDENROD-Project Managers

EEI ENGINEERING ENTERPRISES, INC.

Week Ending 4/1/90

Employee No.: 6330 Name: Melba Gonzalez Signature: Melba Gonzalez

Project No.: 512-345 Project Name: Soil Assessment

TIME REPORT

Date	Hours	Description of Work Performed
3/26	.5	revised report + print out logs
TOTAL	.5	

EXPENSE REPORT

Date	Breakfast	Lunch	Dinner	Motel	Auto Rent Airfare	Gas	Miles Driven	Mileage Claim	Amount	Other Expenses With Description & Remarks, Location, etc.
TOTALS										

APPROVAL

By WEH Date 4-2-90

TOTAL EXPENSES	
NET REIMBURSEMENT	

FOR ACCOUNTING USE ONLY

Accounting No.	Function Code	Project No.	Amount

WHITE-Accounting (payroll) CANARY-Client PINK-Accounting (expenses) GOLDENROD-Project Managers

ENGINEERING ENTERPRISES, INC.

Week Ending 3/25/90

Employee No.: 6540 Name: April LiHong Signature: April LiHong

Project No.: 512-345 Project Name: AMOCO Torrance - Soil Assessment

TIME REPORT

Date	Hours	Description of Work Performed
3/22	1.0	typed out draft and revised logs for "AMOCO"
TOTAL	1.0	

EXPENSE REPORT

Date	Breakfast	Lunch	Dinner	Motel	Auto Rent Airfare	Gas	Miles Driven	Mileage Claim	Amount	Other Expenses With Description & Remarks, Location, etc.
TOTALS										

APPROVAL

By [signature] Date 3-26-90

TOTAL EXPENSES	
NET REIMBURSEMENT	

FOR ACCOUNTING USE ONLY

Accounting No.	Function Code	Project No.	Amount

EEI ENGINEERING ENTERPRISES, INC.

Week Ending 4/1/90

Employee No.: 6540 Name: April LiHang Signature: April LiHang

Project No.: 512-345 Project Name: AMOCO Torrance - Soil Assessment

TIME REPORT

Date	Hours	Description of Work Performed
3/27	2.5	Reformatted "Report of Additional Subsurface Assessment and Groundwater Sampling, Amoco"; also typed out table of contents & tbls./more revisions
TOTAL	2.5	

EXPENSE REPORT

Date	Breakfast	Lunch	Dinner	Motel	Auto Rent Airfare	Gas	Miles Driven	Mileage Claim	Amount	Other Expenses With Description & Remarks, Location, etc.
TOTALS										

APPROVAL

By WEH Date 4-2-90

TOTAL EXPENSES	
NET REIMBURSEMENT	

FOR ACCOUNTING USE ONLY

Accounting No.	Function Code	Project No.	Amount

WHITE-Accounting (payroll) CANARY-Client PINK-Accounting (expenses) GOLDENROD-Project Managers

EEI ENGINEERING ENTERPRISES, INC.

Week Ending 4/1/90

Employee No.: 6835 Name: CHRISTINE WOOLSEY Signature: Christine J. Woolsey

Project No.: 512-345 Project Name: AMOCO

TIME REPORT

Date	Hours	Description of Work Performed
3/26	2.0	copying report
TOTAL	2.0	

EXPENSE REPORT

Date	Breakfast	Lunch	Dinner	Motel	Auto Rent Airfare	Gas	Miles Driven	Mileage Claim	Amount	Other Expenses With Description & Remarks, Location, etc.
TOTALS										

APPROVAL

By WEH Date 4-2-90

TOTAL EXPENSES	
NET REIMBURSEMENT	

FOR ACCOUNTING USE ONLY

Accounting No.	Function Code	Project No.	Amount

WHITE-Accounting (payroll) CANARY-Client PINK-Accounting (expenses) GOLDENROD-Project Managers

No. 4078

LAS PALMAS TRUE VALUE HARDWARE INC.

Mail Address
21814 SO. AVALON — CARSON & AVALON
CARSON, CALIF. 90745
PHONE: 835-1624

RECEIVED MAR 0 8 1990

Customer's Order No. ______ Date 2-1-1990

Name ENGINEERING ENTER.

Address 5555 E. P.C.H.

LONG BEACH 90810

SOLD BY	CASH	C.O.D.	CHARGE	ON ACCT.	MDSE. RETD.	PAID OUT
			X			

QUAN.	DESCRIPTION	PRICE	AMOUNT	
6	rope	339	20	34
		tax	1	37
			21	71

...ved:

Approved By: WEd

Charge To: ~~[illegible]~~ Amount:

512-345 21.71

#2046

TOTAL

SERVICE CHARGE OF 1% PER MONTH (12% PER ANNUM) ON PAST DUE ACCOUNTS.

Rec'd By [signature]

JG # 512-345

No. 4080

LAS PALMAS TRUE VALUE HARDWARE INC.

True Value

Mail Address
21814 SO. AVALON — CARSON & AVALON
CARSON, CALIF. 90745
PHONE: 835-1624

RECEIVED MAR 0 8 1990

Customer's Order No. Bill   Date Feb 1 1990

Name ENGINEERING ENTER.

Address 3335 E. P.C.H.

LONG BEACH 90810

SOLD BY	CASH	C.O.D.	CHARGE	ON ACCT.	MDSE. RETD.	PAID OUT	
			X				

QUAN.	DESCRIPTION	PRICE	AMOUNT
3	Bucket	3 98	11 94
	Tx		81
			12 75
	TOTAL		

Received:

Approved By: GEH

Charge To: [redacted] Amount: 12.75

512-345

#2046

SERVICE CHARGE OF 1% PER MONTH (12% PER ANNUM) ON PAST DUE ACCOUNTS.

Rec'd By Catin Lin

Analytical**Technologies,**Inc.

Corporate Offices:
5550 Morehouse Drive
San Diego, CA 92121
(619) 458-9141

INVOICE

SD 05850

PAGE 1

BILLED TO : ENGINEERING ENTERPRISES-LONG BEACH
6695 E. PACIFIC COAST HIGHWAY
LONG BEACH, CA 90803
213/430-6500

ACCESSION # : 002037
DATE : 03/01/90

CUSTOMER # : 340725

AUTHORIZED BY : BILL HALBERT

P.O. # :

PROJECT NAME :
PROJECT # : 512-345

*** SAMPLES RECEIVED ON 02/02/90

TEST DESCRIPTION	QTY.	PRICE	SURCHARGE	TOTAL
EPA 8240 (GC/MS FOR VOLATILE ORGANICS)	7	250.00	0.00	1750.00
			SUBTOTAL	1750.00
			DISCOUNT(10%) -	175.00
	REDI EXPRESS			15.00
		REMIT THIS AMOUNT ---> $		1590.00

3-2-90
512-345
$1690.00

#301

TERMS: Net 30 Days - 1½% Finance Charge on Balance Due over 30 days.

ATI-002

DISTRIBUTION: White-Customer, Yellow-File, Pink-Accounting

RECEIVED MAR 1 2 1990

Analytical**Technologies,**Inc.

Corporate Offices:
5550 Morehouse Drive
San Diego, CA 92121
(619) 458-9141

INVOICE

SD 05923

PAGE 1

BILLED TO : ENGINEERING ENTERPRISES-LONG BEACH
6695 E. PACIFIC COAST HIGHWAY
LONG BEACH,CA 90803
213/430-6500

ACCESSION # : 002220
DATE : 03/08/90

CUSTOMER # : 340725

AUTHORIZED BY : TOM DANAHER

P.O. # :

PROJECT NAME :
PROJECT # 512-345 Amoco

*** SAMPLES RECEIVED ON 02/16/90

TEST DESCRIPTION	QTY.	PRICE	SURCHARGE	TOTAL
EPA 8240 (GC/MS FOR VOLATILE ORGANICS)	10	300.00	0.00	3000.00
			SUBTOTAL	3000.00
			DISCOUNT(10%) -	300.00
	REDI EXPRESS			15.00
		REMIT THIS AMOUNT ---> $		2715.00

ENTERED MAR 29 1990

Received:

Approved By: WEH 3-13-90

Charge To: 512-345 Amount: 2715.00

#371

TERMS: Net 30 Days - 1½% Finance Charge on Balance Due over 30 days.

ATI-002

DISTRIBUTION: White-Customer, Yellow-File, Pink-Accounting

ENGINEERING ENTERPRISES, INC.
1225 West Main Street
Norman, Oklahoma 73069
FIN 73-0933839 (405)329-8300

Project: 512-345-00 AMOCO Chemical
SERVICES & REIMB COSTS

Invoice No. 4792
June 14, 1990
Page number 1

AMOCO CORP.
MR. BOB HOCKMAN
P.O. BOX 3385
TULSA OK 74102

PROFESSIONAL SERVICES PERIOD ENDING May 27, 1990

Professional Services

	Date	Hours	Rate	Amount	
ENGINEERING & TECH. STAFF					
Halbert, William					
.	5-13-90	5.00	74.00	370.00	
Tinoco, Luan A.					
.	5-20-90	1.00	49.00	49.00	
Services Total:		6.00		419.00	419.00

Consultant Expenses

	Date	Cost	Multiplier	Amount	
CONSULTANT					
Robt. T. Bean 1.5 hours	5-02-90	150.00	1.100	165.00	
		CONSULTANT total		165.00	
		Consultants total:		165.00	165.00
			Current Charges:		584.00

Invoices not paid in 30 days subject to interest @ 1.50% mo.

EEI ENGINEERING ENTERPRISES, INC.

Week Ending 5-13-90

Employee No.: 6360 Name: W. HALBERT Signature:

Project No.: 512-345 Project Name: AMOCO TORRANCE

TIME REPORT

Date	Hours	Description of Work Performed
5-9	5	Revise Report per Amoco request
TOTAL	5	

EXPENSE REPORT

Date	Breakfast	Lunch	Dinner	Motel	Auto Rent Airfare	Gas	Miles Driven	Mileage Claim	Amount	Other Expenses With Description & Remarks, Location, etc.
TOTALS										

APPROVAL

By WEH Date 5-14

TOTAL EXPENSES	
NET REIMBURSEMENT	

FOR ACCOUNTING USE ONLY

Accounting No.	Function Code	Project No.	Amount

EEI ENGINEERING ENTERPRISES, INC.

Week Ending 5-20-1990

Employee No.: 6732 Name: LUAN A. TINOCO Signature: Luan A. Tinoco

Project No.: 512-345 Project Name:

TIME REPORT

Date	Hours	Description of Work Performed
5/15	.5	REVISE GROUNDWATER TEXT AND CHANGE FIG. NUMBERS
5/17	.5	REVISE TITLEBLOCK NOT TO INCLUDE ISOPLETH
TOTAL	1.0	

EXPENSE REPORT

Date	Breakfast	Lunch	Dinner	Motel	Auto Rent Airfare	Gas	Miles Driven	Mileage Claim	Amount	Other Expenses With Description & Remarks, Location, etc.
TOTALS										

APPROVAL

By WEA Date 5-21-90

TOTAL EXPENSES	
NET REIMBURSEMENT	

FOR ACCOUNTING USE ONLY

Accounting No.	Function Code	Project No.	Amount

GROUNDWATER
MANAGEMENT
QUALITY

2729 WILLOWHAVEN DRIVE
LA CRESCENTA, CALIFORNIA 91214
(818) 249-0384

ROBERT T. BEAN
CONSULTING GEOLOGIST

May 2, 1990

Simon-EEI
6695 E. Pacific Coast Highway
Long Beach, CA 90803

For professional services

Review of various reports, as follows:

March 30	Amoco	Proj. 512-345	1.5	hrs.
April 2 & 3	Conoco-Sta.Ana	" 512-224.01	2.5	"
" 12	Jack's Auto-Dir's Guild	Proj. 512-517	1	"
" 13 & 14	Same	" " "	1.5	"
" 14	Arco	" 512-070.05	1	"
		Total time	7.5	hrs.
		7.5 hours @ $100 =	$750.00	

Expenses:

March 30	La Crescenta-Long Beach & ret. 84 mi. @ $0.25 =	21.00
April 14	Express mail	12.00
	TOTAL	$783.00

Received:

Approved By:

Charge To: 512-517 Amount: 2.5 hrs. @100= $250

512-345 150.

512-224.01 250.

512-070.05 112.00 JB

#541 Contract Services 603.004.21 21.00

ENTERED MAY 18 1990

ENGINEERING
ENTERPRISES, INC.

WATER RESOURCES SPECIALISTS

21818 S. Wilmington Avenue, Suite 405 Long Beach, CA 90810 213/518-4597

January 23, 1989

Amoco Corporation
Mail Code 4903
200 East Randolf Drive
Chicago, Illinois 60601

Attention: Mr. Mark Passarini

Subject: Remedial Options
Amoco Chemical Facility
Torrance, California
Project No. 512-345

Dear Mr. Passarini:

INTRODUCTION

In response to your request, Engineering Enterprises, Inc. has prepared the following outline of remedial options to address soil at your Torrance, California facility affected by ethyl benzene and styrene. Tetrachloroethene is also known to be present in soil at the site. If the tetrachloroethene present at the Amoco facility is a spent solvent, the affected soil may not be disposed of at a landfill under the "first third" rule (40 CFR 268). The following options, excepting biotreatment, assume the tetrachloroethene is not a spent solvent and that Amoco will provide the landfill with a statement to that effect.

REMEDIAL OPTIONS

Presented below are soil remediation options and associated costs. The costs presented are not intended to represent absolute costs for the various alternatives, nor is this a proposal for EEI to conduct the transportation and disposal of affected soil. An estimate of 1,002 tons of soil was used for the following cost approximations.

Option #1: Transportation and Disposal
USPCI Facility
Grassy Mountain, Utah

Restrictions: o Material passes ignitability, corrosivity, reactivity and EP toxicity.

Option #1 cont'd

- o Tetrachloroethene is certified by Amoco to not be a spent solvent.

Cost per ton: $70 disposal
$70 transportation
$40 tax

Estimated cost: $180,961

Option #2: Transportation and Disposal
IT Facility
Westmoreland, California

Restrictions:
- o Material passes ignitability, corrosivity, reactivity and EP toxicity.
- o Tetrachloroethene is certified by Amoco to not be a spent solvent.
- o Transported under a non-hazardous waste manifest.

Cost per ton: $90 disposal
$36 transportation
$12.60 tax

Estimated cost: $138,877

Option #3: Transportation and Disposal
Liquid Waste Management Facility
Bakersfield, California

Restrictions:
- o Material passes ignitability, corrosivity, reactivity and EP toxicity.
- o Tetrachloroethene is certified by Amoco to not be a spent solvent.
- o Transported under a Non-hazardous waste manifest.
- o Prior approval of Liquid Waste Management landfill.

Cost per ton: $100 transportation, disposal and tax

Estimated cost: $100,200

Option #4: Onsite Bioremediation of Soil

Requirements:
- o Excavation and spreading of soil onsite.
- o Agency involvement to obtain permits.
- o May require 6 weeks to complete.

Option #4 cont'd

Cost per ton: $30 treatment
$10 transportation and disposal

Estimated cost: $40,080 BS

Substantial cost savings may be realized by reducing the amount of affected soil disposed. This may be achieved through grid sampling and laboratory analysis to delineate affected areas.

-oOo-

We trust the disposal options outlined above meet your current needs. Please do not hesitate to contact us should you have further questions regarding this project. We look forward to being of continued service to Amoco on this project.

Sincerely,

W.E. Halbert

William E. Halbert
Project Hydrogeologist

Stephen M. Testa

Stephen M. Testa
Vice President
West Coast Operations

REGISTERED GEOLOGIST
STEPHEN M. TESTA
3806
STATE OF CALIFORNIA

cc: John Verrier, Amoco
Bob Hockman, Amoco
Bill Kerr, Amoco

a:amoco2.prp

ENGINEERING ENTERPRISES, INC.

WATER RESOURCES SPECIALISTS

21818 S. Wilmington Avenue, Suite 405 Long Beach, CA 90810 213/518-4597

January 18, 1989

Amoco Corporation
Mail Code 4903
200 East Randolf Drive
Chicago, Illinois 60601

Attention: Mr. Mark Passarini

Subject: Proposal for
Additional Site Characterization
Amoco Chemical Facility
Torrance, California

Dear Mr. Passarini:

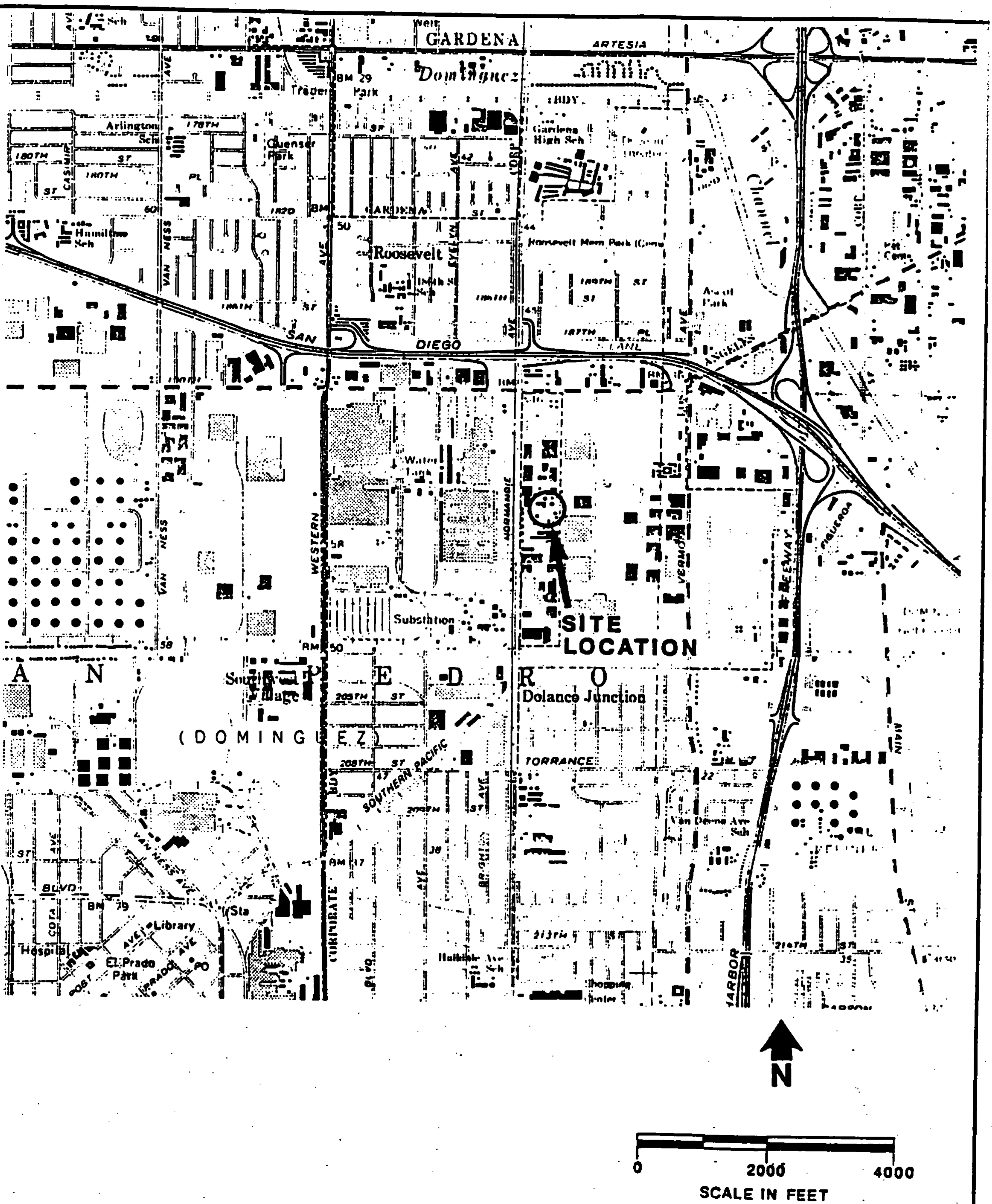
Engineering Enterprises, Inc. (EEI) is pleased to provide Amoco Corporation with this proposal for additional site characterization at the Torrance, California facility (Figure 1). The additional characterization has been requested by Amoco Corporation to further evaluate areas of soil within bermed tank enclosures which contain elevated concentrations of ethyl benzene and styrene.

1.0 INTRODUCTION

Amoco Corporation currently operates a facility for the manufacture of plastic granules in Torrance, California (Figure 1). Styrene, used in the process, is stored onsite in above ground storage tanks. To upgrade the facility and control accidental spills or releases, Amoco has undertaken a program to line the bermed areas surrounding the tanks with concrete (Figure 2). Styrene and a breakdown product, ethyl benzene, are known to affect soils in the bermed areas to a depth of at least 5 feet due to accidental spillage based on sampling and analysis of five soil samples from the bermed areas (EEI, 1988). To further assess the lateral and vertical extent of contamination, EEI will sample and chemically analyze additional soil samples from the bermed areas.

2.0 PURPOSE

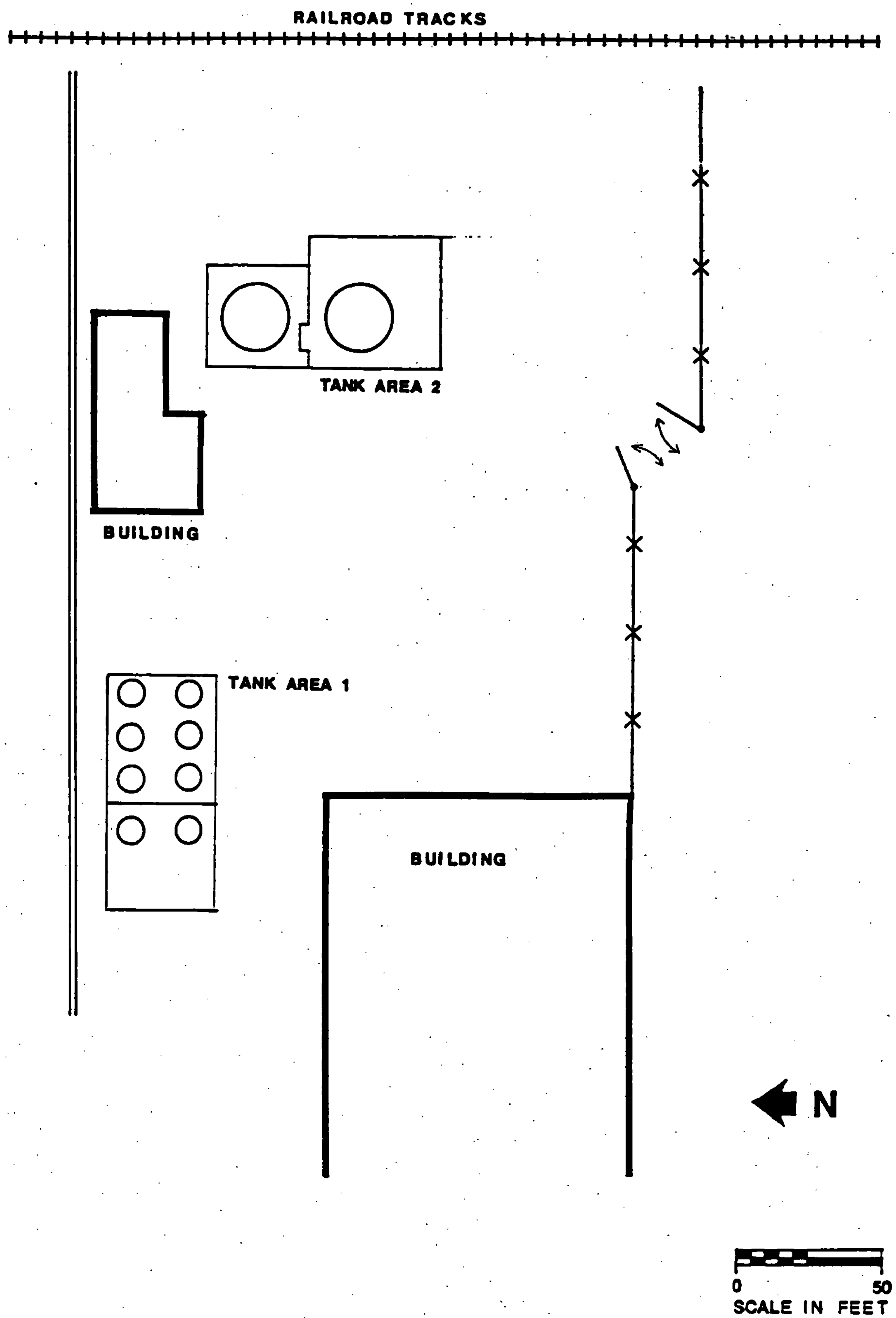
The purpose of the proposed additional characterization is to evaluate the lateral and vertical extent of affected soil within the bermed areas surrounding the storage tanks. This information will be utilized during excavation activities to segregate affected and unaffected soil for disposal considerations.



SITE LOCATION MAP
AMCO CHEMICAL FACILITY
TORRANCE, CALIFORNIA

EEI ENGINEERING ENTERPRISES, INC.

PROJECT NO: 512-345	FIGURE: 1
DATE:	



PLOT PLAN
AMOCO CHEMICAL FACTORY
TORRANCE, CALIFORNIA

ENGINEERING ENTERPRISES, INC.

PROJECT NO: 1-89-290

FIGURE: 2

DATE: JANUARY [illegible]

3.0 SCOPE OF SERVICES

To achieve the above stated purpose, the following scope of services will be performed:

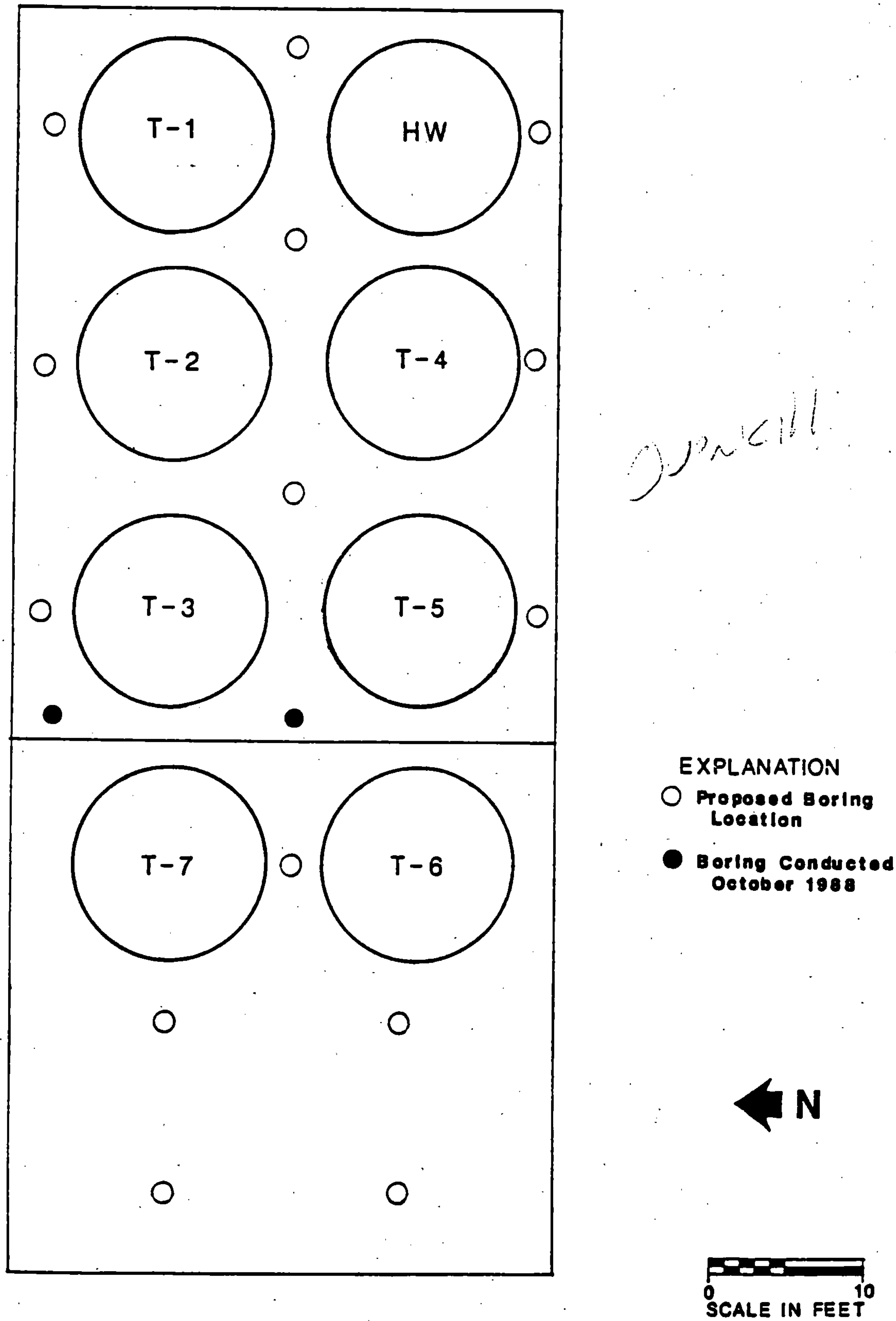
- o Drill and sample 22 exploratory borings;
- o Chemically analyze soil samples from each boring, and;
- o Prepare a brief report presenting laboratory results and sampling locations.

3.1 INVESTIGATIVE METHODS

Twenty two exploratory borings will be drilled in locations depicted in Figures 3 and 4. Borings will be drilled using manually-advanced soil augers to maximum depths of 5 feet below ground surface. Relatively undisturbed soil samples will be collected for laboratory analysis at depths of one, three and five feet below ground surface. Soil samples will be collected using a hand-operated slide hammer sampler into clean, brass sample tubes. When the sampler is retrieved, the brass sample tube will be removed and the ends covered with Teflon sheeting, plastic caps and sealed with PVC tape. A sample label will be affixed to each tube which contains: the sample number, job number, boring number, date and collectors initials. Samples will then be placed in an ice chest containing ice for transport to the analytical laboratory. Chain-of-Custody forms will be completed in the field and will accompany the samples to the analytical laboratory.

Soil will be classified in accordance with the Unified Soil Classification System. To reduce the possibility of cross contamination, all downhole equipment will be washed in a dilute solution of trisodium phosphate, rinsed in both fresh and distilled water and dried. Equipment will be washed both prior to sampling and between samples. Upon completion, borings will be filled with granular bentonite to reduce the chance of downward migration of contaminants.

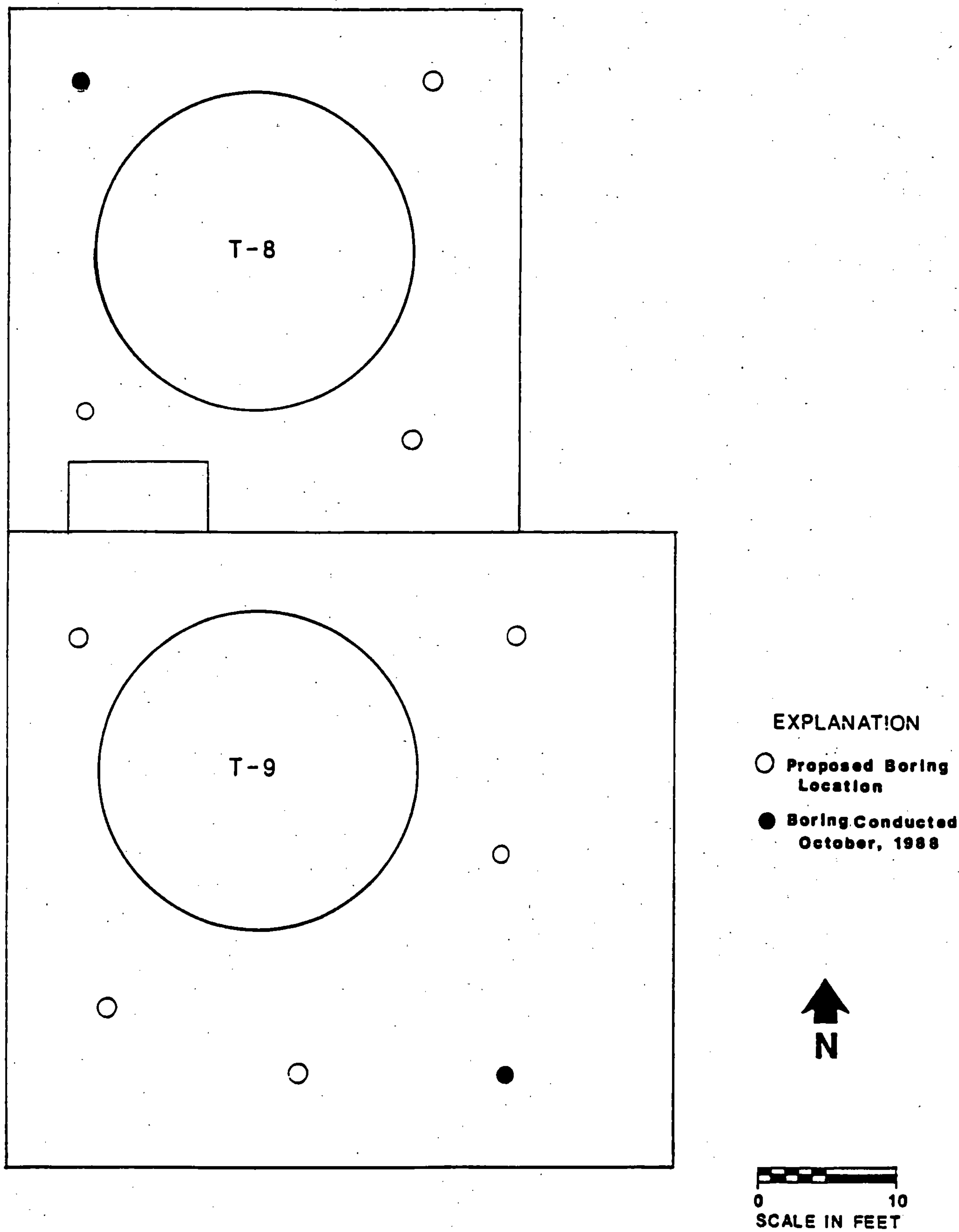
Organic soil vapors will be monitored at one-foot increments during the drilling of the borings using an HNU photoionization detector (PID). Soil will be retrieved from the barrel of the auger and placed in a sealable plastic bag. The bag will be labeled as to boring number and sample depth and the soil allowed to outgas for approximately 5 to 10 minutes. At that time, the bag will be pierced with the sample probe of the PID and the maximum needle deflection observed and recorded.



BORING LOCATION MAP
TANK AREA 1
AMOCO CHEMICAL FACTORY
TORRANCE, CALIFORNIA

EEI ENGINEERING ENTERPRISES, INC.

PROJECT NO:	1-89-290	FIGURE: 3
DATE:	JANUARY, 1989	



BORING LOCATION MAP
TANK AREA 2
AMOCO CHEMICAL FACTORY
TORRANCE, CALIFORNIA

ENGINEERING ENTERPRISES, INC.

PROJECT NO: 1-89-290

FIGURE: 4

DATE: JANUARY, 1989

3.2 LABORATORY ANALYSIS

Soil samples will be delivered to a California certified laboratory for chemical analysis. Initially, soil samples from the one-foot interval will be analyzed for volatile organic compounds using EPA method 8240. If chemical analysis indicates the presence of styrene or ethyl benzene above a concentration of 1 mg/kg, the sample corresponding to the three-foot interval will be analyzed. If the concentration of 1 mg/kg is exceeded in the three-foot interval, the sample from the five-foot interval will be analyzed. One sample will be analyzed for flash point, corrosivity, reactivity and toxicity (EP Tox) for the purposes of defining disposal costs.

3.3 REPORT PREPARATION

Following reciept of laboratory results, the data will be evaluated and a brief report prepared. The report will contain a summary of sampling methods, laboratory results, figures of sample locations and areas of affected soil, geologic conditions encountered and EEI's recommendations for further action, as appropriate.

4.0 COST AND SCHEDULE

EEI is prepared to begin work on this project immediately upon authorization to proceed from Amoco Corporation. We anticipate the soil boring to require three days for completion. A nominal period for laboratory results is two to three weeks. EEI proposes to conduct the tasks discussed above on a time-and-expense basis in accordance with our Standard Fee Schedule (Attachment A). The anticipated cost to conduct the scope of services described above is estimated to be $17,358 and is detailed below.

Task Number	Description	Estimated Cost
1	Drilling of exploratory borings (includes equipment, vapor monitor sand sample sleeves)	$ 3,500
2	Laboratory analysis using EPA method 8240 for volatile organic compounds (includes EEI handling)	$11,858
3	Report Preparation	$ 2,000
	Total	$17,358

Too high

- Cut out report
cost 1K
- cut down [illegible]

-oOo-

We trust this proposal meets your current needs. If you have questions regarding the proposal, please do not hesitate to contact us. We look forward to being of continued service to Amoco Corporation.

Respectfully submitted,

William E. Halbert
Project Hydrogeologist

Stephen M. Testa
Vice President
West Coast Operations

REGISTERED GEOLOGIST
STEPHEN M. TESTA
3806
STATE OF CALIFORNIA

cc: John Verrier - Amoco
Bob Hockman - Amoco
Bill Kerr - Amoco

a:amoco1.prp